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BRITISH AND FOREIGN.

Edited by

JAMES BRITTEN, F.L.S.,

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EDITORIAL.

At the end of last year I made a special appeal to the readers of this Journal to extend its circulation. That appeal has been responded to, and I have now the satisfaction of stating as a result that the balance, although not a large one, is this year on the right side. I shall therefore be able during 1884 to return to the original plan of the Journal, and issue a plate with each number. Certain alterations in arrangement —some of which have already been adopted—will enable me to give additional matter without increasing the cost of production.

It is therefore my pleasant task to thank the many friends —some of them known to me, others unknown—whose help has brought about this satisfactory state of affairs. To both contributors and subscribers I tender my grateful acknowledgments for their help in the past, while I venture to express a confident hope that I may look forward to its continuance in the future.

JAMES BRITTEN.

3, Gumley Row, Isleworth,
Dec. 1, 1883.

The General Index is about half finished, and it is hoped to issue it in 1884. Additional subscribers are still needed in in order that the expense of printing may be met.

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THE

JOURNAL OF BOTANY

BRITISH AND FOREIGN.

Original Articles.

A SYNOPSIS OF THE GENUS *SELAGINELLA*.

By J. G. Baker, F.R.S., &c.

Ferns excluded, half the known number of species of vascular Cryptogamia belong to the genus *Selaginella*, as recast by Spring. What was known about them from a structural, systematic, and geographical point of view was fully and carefully summed up by Spring in the second volume of his Monograph on the Lycopodiaceæ' which was published in 1848. Since that date a large number of new species have been collected by various travellers, but only a small proportion of them have been named and described. The genus at the present time would make an excellent subject for a new monograph on the scale of Spring's, and I should much like to recommend such an undertaking to any of our younger cryptogamists who are in search of a speciality. What I have attempted in the present paper is merely a working synopsis on the same scale as our 'Synopsis Filicum.' The leaf-organs in this genus, by their arrangement upon either a distichous or multifarious plan and their uniformity in shape and character or dimorphism, furnish four excellent primary subdivisions, and there is seldom, although not invariably, any room for doubt under which any given species, when in a state of fructification, should be classified. In *Selaginella* dimorphism in shape and the distichous plan in arrangement is the rule as regards the proper leaves, but we have an exception to this in the only British representative of the genus and a few of its allies. In *Lycopodium*, on the other hand, uniformity in shape and the multifarious plan in arrangement is almost universal, there being three exceptional species (*complanatum*, *volubile*, and *scariosum*). The Selaginellas have always the fructification concentrated into a distinct terminal spike, never as in the *Selago* Lycopodiums (which constitute half the genus) and *Psilotum*, placed in the axils of entirely unmodified leaves all down the stem. In a minority, but yet a considerable number of Selaginellas, dimorphism in shape and a distichous plan of arrangement is carried out not only in the proper leaves, but also in the bracts

of the spike. Nearly always (and I am quite unable to see any reason for this, and should much like to have it explained) the smaller bracts are on the same plane as the larger leaves, and the larger bracts are on the same plane as the smaller and more ascending leaves. In the majority of Selaginellas (those constituting the subgenus for which I have used Palisot Beauvois' name of *Stachygynandrum*) we have distichous dimorphic leaves, but a square fruit-spike, with bracts of uniform shape. The genus is concentrated in the tropical zone, and has its head-quarters in Tropical America. Only two species extend their range into Europe, and the Selaginellas of the Cape, Temperate Australia, and South Temperate America are neither numerous nor remarkable. In the New World and the Old World the species are entirely different, with but one exception amongst the distichous-leaved tropical species, *S. flabellata*, and two of the multifarious-leaved species, *S. rupestris* and *spinulosa*, both of which are characteristically temperate types. It is very rarely that any of the tropical species is found in more than one of the three continents, but it will be seen that three out of the four subgenera and most of the subordinate groups are represented alike in America, Asia, and Africa.

1. Selaginella (P. B.), Spring.*

Sporangia minute, orbicular, laterally compressed, membranous, 1-celled, inserted in the axils of bracts so as to form a dense spike at the end of the leafy branches, the microsporangia numerous, the macrosporangia few and confined to the base of the spike. Microsporangia slitting across the top of the broad diameter, containing numerous dust-like microspores. Macrosporangia usually also 2-valved, containing four or fewer macrospores.—Habit entirely of *Lycopodium*, from which it differs by its dimorphic spores and sporangia, some of the species small and fugacious, resembling *Hepaticæ*, with not more than two vascular bundles on the main stems. Stems copiously branched, the ultimate branching usually flabellato-dichotomous, trailing, suberect, sarmentose or scandent, with the root-fibres confined to the base, or in the trailing species extending to the upper nodes; in shape more or less distinctly quadrangular, the faces angled (stems goniotropous, Spring) or the faces flat (stems pleurotropous, Spring); nodes sometimes distinctly articulated. Leaves small, furnished only with a single central vein, usually tetrastichous and dimorphous and more or less oblique, the two rows† of the lower plane larger and more

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* For further information see Spring's elaborate Monograph in vol. 24 of the 'Memoirs of the Royal Academy of Belgium'; Hooker and Greville's "Enumeration," in Hooker's 'Botanical Miscellany,' vol. ii., p. 360, and vol, iii., 104; A. Braun's papers in the Reports of the Berlin Garden (especially that reprinted in Ann. Sc. Nat., 4th series, vol. 13, p. 54); Triana and Planchon's 'Cryptogamia of New Granada;' Kuhn's 'Filices Africanæ'; and in 'Monatsbericht der K. Preuss. Akad.,' April, 1865, pp. 185—209.

† Spring distinguishes in the dimorphic-leaved species between *folia synedra*, in which the leaves are inserted on the angles of the stem, and *folia cathedra*, in which they are inserted on its faces.

spreading, the two rows of the upper ascending, adpressed to the stem and imbricated; in the subgenus *Euselaginella* multifarious, or, if tetrastichous, all alike. Spikes usually tetrastichous and often sharply square, but in two subgenera dimorphic on the same plan as the leaves, but mostly resupinate (*i. e.*, the small bracts on the same plane as the large leaves, and *vice versâ*.

CLAVIS.

Subgenus I. SELAGINELLA proper. Ordinary leaves all alike, multifarious. Bracts uniform.

Spikes not sharply square .	Sp. 1–5
Spikes sharply square .	Sp. 6–8

Subgenus II. STACHYGYNANDRUM. Ordinary leaves of two kinds and spreading in two planes, those of the upper plane smaller and more ascending. Bracts uniform.

Series I. DECUMBENTES. Dwarf species with the main stem decumbent and root-fibres extending to its upper nodes.

Group 1. *Microphyllæ*. Persistent species, with leaves of firm or moderately firm texture, continuous stems, and leafy branches not more than 1-12th–1-8th in. broad.

Asiatic and European .	Sp. 9–16
African	Sp. 17–22
American . . .	Sp. 23–51

Group 2. *Plumosæ*. Persistent species, with leaves of firm or moderately firm texture, continuous stems, and leafy branches $\frac{1}{4}$–$\frac{1}{3}$ in. broad.

Asiatic	Sp. 52–57
African . . .	Sp. 58–66
American . . .	Sp. 67–92
Country unknown . .	Sp. 93

Group 3. *Stoloniferæ*. Persistent species, with articulated stems (all but one American) . Sp. 94–112

Group 4. *Apodæ*. Fugacious species, mostly tropical annuals of the rainy season, with continuous stems.

Asiatic . . .	Sp. 113–118
African . . .	Sp. 119–121
American . . .	Sp. 122–140

Series II. ASCENDENTES. Stems ascending, branched down to the base, with the root-fibres confined to the nodes of the lower half.

Group 1. *Suberectæ*. Persistent species, with continuous stems, the leaves small, the leafy branches not more than 1-12th–1-6th in. broad.

Asiatic and Polynesian .	Sp. 141–147
American . . .	Sp. 148–149

Group 2. *Atrovirides*. Persistent species, with continuous stems and broad leafy branches.

Asiatic . . .	Sp. 150–156
African . . .	Sp. 157
American . . .	Sp. 158–169
Country unknown .	Sp. 170

Group 3. *Articulatæ*. Persistent species, with articulated stems(all American) . Sp. 171–174

Group 4. *Radiatæ*. Fugacious species, mostly tropical annuals of the rainy season, with unjointed stems.

Old World . . .	Sp. 175–181
New World . . .	Sp. 182–187

Series III. Rosulatæ. Stems densely tufted, curling up in drought, sometimes, but not always, branched down to the base, the root-fibres confined to the base.

Old World . . .	Sp. 188–193
New World . . .	Sp. 194–197

Series IV. Sarmentosæ. Persistent species, with elongated stems branched nearly or quite down to the base.

Asiatic and Polynesian .	Sp. 198–207
American . . .	Sp. 208

Series V. Scandentes. Persistent species, with wide-climbing continuous stems . . Sp. 209–211

Series VI. Caulescentes. Persistent species, with erect stems, simple in the lower part, decompound and frond-like upwards, the root-fibres confined to the base.

Group 1. *Flabellatæ*. Stems continuous.

Asiatic . . .	Sp. 212–229
African . . .	Sp. 230–233
American . . .	Sp. 234–246

Group 2. *Geniculatæ*. Stems articulated (all American) Sp. 247–250

Subgenus III. Homostachys. Ordinary leaves of two kinds, and spreading in two planes. Bracts also dimorphous, the smaller bracts in the same plane as the smaller, more ascending leaves . . . . . Sp. 251–252

Subgenus IV. Heterostachys. Ordinary leaves of two kinds, and spreading in two planes. Bracts also of two kinds, but the spikes resupinate (*i. e.*, the smaller bracts in the same plane as the larger leaves, and *vice versâ*).

Group 1. *Bisulcatæ*. Persistent species, with decumbent continuous main stems.

All Asiatic . . .	Sp. 253–256

Group 2. *Proniflorœ.* Fugacious species, with decumbent continuous main stems.

Asiatic and Polynesian .	Sp. 257–270
American . . .	Sp. 271–273

Group 3. *Brachystachyæ.* Persistent species with continuous ascending stems.

Asiatic . . .	Sp. 274–275
African . . .	Sp. 276–277

Group 4. *Suberosæ.* Fugacious species, with continuous ascending stems.

Asiatic and Polynesian .	Sp. 278–296
African . . .	Sp. 297–303
American . . .	Sp. 304–312

(To be continued.)

CINCHONA LEDGERIANA A HYBRID.

By Otto Kuntze, Ph.D.

Dr. Henry Trimen published in this Journal for 1881 (pp. 321–325) a paper entitled "*Cinchona Ledgeriana*, a distinct species," wherein he maintains that *C. Ledgeriana* is not a variety of *C. Calisaya*, as Mr. J. E. Howard had supposed. He cites the following marks in support of his position:—(1) the leaves of *C. Ledgeriana* have always the broadest part at or about the middle, (2) the flowers approach those of *C. micrantha* in their drooping habit, small size, short inflated tube, white colour, and also (3) by their buds, which are not at all or very slightly widened at the end, and never abruptly enlarged there, as they are in *C. Calisaya*. This last character is new to me.

C. Calisaya and *C. micrantha* are the only species mentioned as nearly allied to *C. Ledgeriana*. I have described indeed *C. Ledgeriana* as a hybrid of these two species in my monograph of Cinchona,* wherein I acknowledge only four species: — *Wreddelliana* = *C. Calisaya* pro parte; *C. Pavoniana* = *C. micrantha* p.p.; *C. Howardiana* = *C. succirubra* p. p. and *C. Pahudiana* How. All other Cinchonas I regard as synonyms or hybrids of those four species. The hybridization of Cinchonas has been proved (1) by some direct artificial production of several hybrids, (2) by the fact that the seeds of marked trees produced plants with the mixed characters of another species. There cannot be any doubt as to the copious hybridization of Cinchonas; and it is well known that the hybrids in the Cinchona plantations have plenty of good fertile seeds; only *C. Ledgeriana* shows an exception, and its more or less great sterility has been often noticed.

* 'Cinchona. Arten, Hybriden und Cultur der Chininbäume.' Leipzig, 1878; Verlag von Haessel.

Cinchona Ledgeriana originated spontaneously in the government plantations of Mungpo in Sikkim, as published by me in my monograph of Cinchona. Dr. Trimen did not know this fact, and it would seem that he has not read my monograph; for he writes (p. 322), "I made inquiries of Mr. Moens, who assured me that he never saw anything like *Ledgeriana* . . . . to come from seed of a *Calisaya*. I understand that Mr. Gammie has the same experience." During my visit to Java I never observed spontaneous *C. Ledgeriana*, but in Mungpo-Sikkim Mr. Gammie and the late Mr. Biermann assured me that "*C. Ledgeriana* had originated spontaneously there in the Calisaya-field." Besides Dr. Trimen supports this statement, saying "In our own plantations in Sikkim, after years of neglect as one of the troublesome and hopelessly variable forms of *C. Calisaya*, the plant (*C. Ledgeriana*) is now the object of careful cultivation." Dr. Trimen is therefore in error to write that "all existing plants in the East are descendants of seeds collected . . . in Bolivia, in June, 1865."

But the testimony of the Cinchona cultivators—valuable as it may be—is not necessary, for we know a fact that proves the hybrid origin of *C. Ledgeriana* in Mungpo: the imported Cinchonas in Mungpo are trees, with exception of *C. Calisaya*, and all descendants of *C. Calisaya* are shrubs; pure Calisaya are small shrubs, and the hybridized Calisaya are very large shrubs, because the other hybridizing Cinchonas are only trees. *C. Ledgeriana* of Mungpo is also a large shrub; it became only more tree-like by the art of the cultivators, who prefer trees for bark collecting. When I visited Mungpo *C. Ledgeriana* was mostly not yet tree-like.

In contrast to this shrubby *Ledgeriana* of Mungpo the descendants of Bolivian *Ledgeriana* in Java and Southern India, perhaps also in private Sikkim plantations, are veritable trees. I do not know if there has been imported Bolivian *Ledgeriana* to the Mungpo government plantations after 1875; but until that date no Bolivian *Ledgeriana* existed there.

The Mungpo *Ledgeriana* shows another individual mark, by which I can easily distinguish it from Bolivian *Ledgeriana*; the former has very divaricate panicles with slender ramification, the Bolivian descendants have a more dense panicle with thicker or shorter branches. The *C. micrantha* of Mungpo has accidentally such slender divaricate panicles, and all its hybrids at Mungpo, as well as *C. Ledgeriana*, show that individual mark. The Mungpo Calisaya-field is of very great extension, and it is the same place on which the former intendant of that plantation, Mr. C. B. Clarke, sowed the *Calisaya*. Mr. Clarke said in November, 1875, to me, "We sowed *Calisaya* and got other plants," and among these other plants were many shrubs of *C. Ledgeriana*.

I am anxious to correct the erroneous point of Dr. Trimen's publication, because Dr. A. Garcke* has briefly quoted the paper of Dr. Trimen against my deduction of the hybrid origin of *C. Ledgeriana*; he says also "Messrs. Moens and Trimen prove that

* 'Handwörterbuch der Pharmakognosie von Wittstein,' 1882, p. 131.

C. Ledgeriana bears fruits like all other Cinchonas, and they consider it therefore as a distinct species." As all other artificial and spontaneous Cinchona hybrids ripen good seeds plentifully, the fertility only would be no proof for the establishment of a species; besides, the fertility of *C. Ledgeriana* is neither existing nor confirmed by Dr. Trimen in that manner.

Cinchona Ledgeriana is the only Cinchona that suffers from sterility, and only ripens more fruits, if it gets fertilized and hybridized by other Cinchonas; that happens often, and therefore the descendants of *Ledgeriana* are mostly degenerated, and the so-called *Ledgeriana*-bark of Java contains often very little quinine (till only 0·8 per cent!). Dr. Trimen says that "the seedlings [of *C. Ledgeriana*], since Mr. Gammie uprooted nearly all the neighbouring trees, come remarkably true, whereas before that was done the sporting was so great that Dr. King would not propagate by seed at all." No Cinchona species shows a similar degeneration as *C. Ledgeriana* if growing between other Cinchonas; even the Calisaya-field of Mungpo shows yet a greater part of true *C. Calisaya*. Dr. Trimen says nothing about the great fertility of *C. Ledgeriana*, as Dr. Garcke supposes, but he gives an illustration of partly abortive fruits. I may refer to some other notes on the fertility of *C. Ledgeriana*: Ledger wrote to Howard,* on the discovery of *C. Ledgeriana* in Bolivia, "he then told me the best bark trees had not produced ripe seeds for four years," whereof frost cannot be the cause, for all other Cinchonas there around ripened good seeds. In the "Berigte nopens de Gouvernements Kina Onderneming" (2. Kwartaal 1874, No. 19) we read, *C. Ledgerianas* give few seeds, and deceive us; the best trees were flowering to death. In the 3rd Kwartaal, 1875: from *C. Ledgeriana* only fifty trees ripen sometimes a few fruits. In the 4th Kwartaal, 1877: the seeds of *C. Ledgeriana* have failed. Visiting the Java and Mungpo plantations I observed also the poor fertility of *C. Ledgeriana*.

As all other Cinchona hybrids are always extremely fertile, I suppose *C. Ledgeriana* must be an irregular hybrid; irregular, because the several qualities of the two parent species are not well combined as in the regular hybrids of Cinchona. For instance, *C. officinalis* Hooker is the regular hybrid of *C. Calisaya* and *C. micrantha*, whilst *C. Ledgeriana* is the irregular hybrid of these two species. Both hybrids have the broadest part of the leaves at or about the middle, because *C. Calisaya* has leaves with the broadest part below the middle, and *C. micrantha* has leaves with the broadest part above the middle; *C. officinalis*, which also originated spontaneously in Mungpo, shows intermediate flowers and fruits with little variability, but *C. Ledgeriana* possesses the flowers of *C. micrantha* and the fruits of *C. Calisaya*, and shows great variability. Dr. Trimen confirms the great affinity of *C. officinalis* and *C. Ledgeriana* by writing that it is indeed not always easy to distinguish *C. officinalis* from *C. Ledgeriana*.

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* Howard, 'The Quinology of the East Indies,' ii., iii., p. 48.

If we consider that (1) *C. Ledgeriana* after its doubtless origin as a high shrub in the Calisaya-field of Mungpo must be a hybrid, (2) *C. Ledgeriana* is a very rare plant of the American Cinchona region, (3) *C. Ledgeriana* shows only small fertility with its own pollen, (4) *C. Ledgeriana* shows the best character of hybrids in preferring strange pollen to its own, as its typical degeneration proves, (5) *C. Ledgeriana* shows only the specific qualities of *C. Calisaya* and *C. micrantha*—we must conclude that *C. Ledgeriana* is neither a variety of *C. Calisaya* nor a distinct species, but a hybrid of *C. Calisaya* with *C. micrantha*.

I gave two theses on the quantity of quinine in the bark relating to the hybridity :—

(1) Only for the regular hybrids: the quantity of quinine increases by hybridity. For instance, the bark containing quinine averages :*—

I. *C. Howardiana* (*succirubra*, p. p.), 0·98 per cent.
II. *C. Pahudiana* Howard, 0·15 per cent.
III. *C. Paroniana* (*micrantha* p. p.), 0·01 per cent.
IV. *C. Weddelliana* (*Calisaya* p. p.), 0·84 per cent.
I. × II. (*C. pubescens* Vahl, *cordifolia* Mutis, *purpurea* R. & P., *caloptera* Miq.), 0·72 per cent.
I. × III. (*C. heterophylla* Pavon), no analysis existing.
I. × IV. (*C. lancifolia* Mutis.), 1·20 per cent.
II. × III. (*C. orata* Wedd.), no analysis existing.
II. × IV. (*C. Humboldtiana* Lambert, *C. Hasskarliana* Miq.), 0·70 per cent.
III. × IV. (*C. officinalis* Hooker), 2·58 per cent.

(2). Only for irregular hybrids (till now only *C. Ledgeriana*): with the greater irregularity (*i. e.* the more the several marks of the parents are separate in the hybrid) increases the quantity of quinine. That is proved by my choice of the best sorts according to the botanical qualities of the many forms of *C. Ledgeriana* in Mungpo, and confirmed by the analysis of their barks.

On the origin of the irregular hybrid I gave the following hypothesis, which must yet be confirmed by experiment: the pollen of a newly sprung hybrid fertilized the ovary of a species. As the regular Cinchona-hybrids of older origin seem to act like species it would be better to prefer new or young hybrids. I recommend the fertilization with pollen of long-styled hybrid flowers on the stigma of long-styled parent (species) flowers, or with the pollen of short-styled hybrid flowers on the stigma of short-styled parent flowers, because the crossing of equal heterostyled flowers acts like a hybridization and therefore the effects of hybridization must be increased. This is only a scientific hypothesis, but the experiment causes no extraordinary expenses to Cinchona planters and it is easy to execute: as the stamens are inserted in the corolla tube it is only necessary to put away, before the corolla is opened (or the pollen is not yet developed), the

* 'Pharmazeutische Zeitung' (Bunzlau), 1879, No. 93; Beilage No. 24.

deciduous corolla from the flower whose stigma shall be fertilized; further to take the opened corolla with mature pollen of the hybrid and to put it over the isolated style of the other plant. The experiment promises great success by increased quantity of quinine, so that it may be recommended to all Cinchona cultivators.

ON THE CHINESE PLANTS COLLECTED BY D'INCARVILLE (1740–1757).

By Francis Blackwell Forbes, F.L.S.

The valuable paper on "Early European Researches into the Flora of China,"* contributed by Dr. Bretschneider to the 'Journal of the North China Branch of the Royal Asiatic Society for 1880,' has already led to the unearthing of one of the botanical treasures to which he drew attention. On page 120 of his pamphlet he noticed the work of the Jesuit Father d'Incarville, who was a missionary in Peking from 1740 till his death there in 1757, and who during his residence not only transmitted to Europe the seeds of many plants which have since become well known in cultivation, but forwarded to his instructor Bernard de Jussieu, in Paris, dried specimens collected with a care unusual at that time. Regarding these specimens Dr. Bretschneider says:—"I am not aware to what number of species this collection amounts. It has been incorporated with the herbarium of the Museum of Paris, but has never been worked up in any regular form. Only a few new plants of it have been occasionally selected for publication by French botanists, and, it is strange to say, from thirty to eighty years and more after the specimens were received in Paris."

Luckily for those who are interested in Chinese plants, the above paragraph attracted the attention of the eminent botanist M. Franchet, who is now on the staff of the Muséum d'Histoire Naturelle in Paris, and who soon succeeded in finding Father d'Incarville's specimens there. Having as far as possible determined them, he laid the result before the Société Botanique de France on January 13th of last year,† exhibiting at the same time the packet of specimens which d'Incarville had collected at and near Peking.

It appears from M. Franchet's paper that d'Incarville's plants are now in the Paris Museum just as they were when generously handed over in 1857 by the heirs of Adr. de Jussieu. The most interesting are 149 species collected in the Peking district, and since preserved in a special packet in the order given them by the collector himself. Of the remaining 144 species, all from Macao, thirty-five specimens are now to be found in the herbarium of

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* Reviewed 'Journ. Bot.,' 1882, p. 248.

† 'Bulletin de la Soc. Bot. de France,' tome xxix. (Deuxième série, tome iv.) Comptes rendus des séances, 1.

A. L. de Jussieu, and the rest have been kept, like the Peking plants, in a special packet.

I append an abstract of M. Franchet's list of the plants, in the belief that it is well worthy of reproduction in a Journal where it will be more accessible to English readers than in the French Botanical Society's 'Transactions.' The letter "P" before the names indicates that the plants were collected in the Peking district, the letter "M" that they came from Macao. An asterisk after the specific name indicates that seeds were transmitted by d'Incarville at the same time as the specimens. M. Franchet informs us that some of these seeds are still at the Museum, while the others were no doubt sown and became the origin of the Chinese plants cultivated for more than a century at the gardens, this being the case with *Polygonum tinctorium* L., *Callistephus chinensis* Nees, *Gleditschia sinensis* Lamk., and probably also with *Sophora japonica* L.

The following translations from M. Franchet's notes may be of interest:—"I must here join my regrets to those of Dr. Bretschneider, and with him deplore the neglect with which Father d'Incarville's plants have been treated for nearly a century and a half. I have found scarcely twenty-five species which have been studied snd named in his two herbaria, and when among these are seen generic types of a real interest like *Ailantus glandulosa* Desf., *Incarvillea sinensis* A. L. Juss., *Cedrela sinensis* Adr. Juss., we cannot help feeling surprised that such materials should not have further stimulated the scientific curiosity of their possessors. Perhaps the reason of this indifference may be sought in the poverty of the specimens, some of which might at first sight appear insufficient for strict determination.

"However this may be, it is none the less true that the types of most of the genera recognised and described by M. de Bunge in 1832 had existed in a French collection since 1740, and that to the learned Jesuit must be referred the discovery of *Orychophragmus*, *Actinidia*, *Xanthoceras*, *Paratropia*, *Myripnois*, *Botryospermum*, &c. Furthermore, he was the first to gather those rare species which up to the present have only been found in Northern China—*Anemone chinensis* Bunge, *Corydalis Bungeana* Turcz., *Zanthoxylum Avicennæ* Lamk., *Indigofera Bungeana* Steud., *Deutzia parviflora* and *D. grandiflora* Bunge, *Oxytropis hirta* Bunge, *Güldenstaedtia multiflora* Bunge, *Viburnum fragrans* Bunge, *Myripnois dioica* Bunge (a curious Asiatic Mutisiacea), *Androsace saxifragæfolia* Bunge, *Syringa amurensis* Rupr. and *S. villosa* Vahl, *Andrachne chinensis* Bunge, *Selaginella mongolica* Rupr. and *S. Stauntoniana* Spring, &c.

"One of the characteristic traits of Father d'Incarville's collections is that each plant has its label, giving sometimes its popular French name, sometimes its name in Latin, or more rarely in Chinese. Besides this, the locality of each plant is exactly indicated, a remarkable thing for that period. For instance, in the little special herbarium the collector has taken care to distinguish the plants gathered in Peking itself from those which came from the mountains near the city. The Macao plants are also kept perfectly

distinct. In these various ways are indicated the care taken by Father d'Incarville in collecting, and the confidence which can be placed in his information."

When I was in Paris last June, on my way home from China, I had the pleasure, by the courtesy of M. Franchet, of looking over the packet of Peking plants. Although the specimens are, as M. Franchet says, poor according to modern ideas, they do not appear to me on the whole worse than some which I have since examined in the Linnean herbarium. That they have abundantly sufficed for determination in the hands of a competent botanist is evident from the fact that, out of the 289 specimens * enumerated, there are only thirteen to which M. Franchet has not ventured to give specific names.

The fate of the early collections of Chinese botanical specimens sent to Europe, with one exception, can hardly be deemed fortunate. The earliest of all was made by James Cunningham, an Englishman in the East India Company's service, who, between the years 1698 and 1703, was stationed at the island of Chusan and at the more southerly port of Amoy. The next collectors were d'Incarville at the north, and Peter Osbeck, who, as chaplain of a Swedish Indiaman, was at Canton for about four months in 1751, or at about the middle period of d'Incarville's missionary residence in Peking. Three other Swedish East India Company's employés—Toreen, Eckeberg, and Sparrmann—were also in Canton between 1762 and 1766, and contributed to science either botanical notes or specimens. Later on, between 1779 and 1782, the Portuguese missionary Loureiro, author of the 'Flora Cochinchinensis,' was also at Canton, where, as Dr. Bretschneider † states, he has enumerated the collection of 294 species.

Of the above the Swedish collectors have fared decidedly the best, because they alone had the inestimable advantage of sending their specimens direct to Linnæus, who forthwith made them available to science by publication. The Linnean herbarium itself, as far as I can judge from a slight examination, appears to tell but little as to the origin of specimens, but I have reason to believe that among his manuscripts will be found enough indications for a tolerably complete list of the Chinese plants which were in his hands. There is a voluminous correspondence with Osbeck, from whom no doubt most of the specimens came, and further information will probably be found among Linnæus's MS. notes in his interleaved copy of the 'Species Plantarum.'

Father d'Incarville's plants, as we see, have only now come to light, nearly 150 years after their collection. Of Loureiro's herbarium, such part as the army of the first Napoleon could manage to carry away from Portugal is now at the Jardin des

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* Although M. Franchet (*l. c.*, p. 3) says that d'Incarville's collections comprise 149 species from the Peking district and 144 species from Macao, or a total of 293 species, his list enumerates only 289 labelled specimens under 273 species. Probably the discrepancy may be due only to a printer's error.

† Bretschneider, *l. c.*, p. 134.

Plantes at Paris, and some specimens sent to England by Lonreiro himself are at the British Museum,† in both cases intercalated in the general collections; in neither case, so far as I am aware, either catalogued or fully worked up.

The English Cunningham, full notices of whose works have been brought together with so much pains by Dr. Bretschneider, cannot be said to have fallen entirely into oblivion, as his name is commemorated in *Cunninghamia sinensis* R. Br. Still, his Chinese collections have remained in the Sloane Herbarium for nearly 200 years, with very few exceptions undetermined. I have lately looked over his Chusan plants, and I agree with the Editor ('Journ. Bot.,' 1882, p. 249) that many of the specimens, small as they mostly are, could be readily identified by anyone familiar with the flora of the neighbouring mainland. A number of them I am sure can be easily matched from my own collections in the Shanghai and Ningpo districts.

Dr. Bretschneider, on page 44 of his 'Early Researches,' says: "It appears from Cunningham's letters and from Petiver's quotations that the latter had also received from Cunningham a collection of Chinese drawings representing Chinese plants. Petiver frequently speaks of Herbarium nostrum sinense pictum." In answer to my recent enquiries at the British Museum, a gentleman well acquainted with the Sloane manuscripts informs me that he has no recollection of ever coming across the "herbarium sinense pictum" among Petiver's papers. On examination, however, I found in Sloane MS. No. 2376, ff. 82–110, a "Catalogus plantarum quarum icones in China delineatæ sunt," which turned out to be a brief enumeration of Tabulæ 1 to 43, each with 18 numbers, making a total of 774 numbers. As Petiver's handwriting appears in this catalogue, it can hardly be doubted that it refers to the "herbarium pictum" in question; and I hope soon to have an opportunity of making a further search for the drawings themselves.

List of Father D'Incarville's Plants.

P Clematis angustifolia *Jacq.*
P Atragene macropetala *Ledeb.*
P Thalictrum petaloideum *L.*
P Anemone chinensis *Bunge.*
P Ranunculus hydrophilus *Bunge.*
P R. Cymbalariæ *Pursh.*
P Aquilegia sp.
P Anona muricata *L.**
P Menispermum dahuricum *DC.*
P Berberis sinensis *Desf.*
M Cocculus ovalifolius *DC.*
P Chelidonium majus *L.*
P Hypecoum erectum *L.*
P Dicentra spectabilis *DC.*
P Corydalis solida *Sm.*
P C. Bungeana *Turcz.*
P Capsella Bursa-pastoris *L.*
P Dontostemon dentatus *Bunge.*
M Erysimum cheiranthoides *L.*
M Lepidium latifolium *L.*
P Orychophragmus sonchifolius *Bunge.*
P Viola Patrinii *DC.*, β. chinensis *Ging.*

† Bretschneider, *l. c.*, pp. 133, 134. 'Journ. Bot.,' 1882, p. 250.

P Viola pinnata *L.*
M Ionidium heterophyllum *Vent.*
P Polygala sibirica *L.*, *var.* tenuifolia *Regel.*
P Stellaria nemorum *L.*
P Malva sylvestris *L.*
M Hibiscus mutabilis *L.**
M H. Rosa-sinensis *L.*
P H. ternatus *Cav.*
P Urena lobata *L.*
P Sida Abutilon *L.*
M S. acuta *Burm.*
M S. humilis *Willd.*
M Helicteres angustifolia *L.*
M Grewia nitida *Juss.* (type).
M Triumfetta Lappula *L.**
P Corchorus acutangulus *L.*
M Actinidia chinensis *Planch.*
M Cardiospermum Halicacabum *L.**
M Nephelium Litchi *Camb.*
M N. Longanum *Hook.*
M Murraya exotica *L.*
M Atalantia monophylla *DC.*
P Geranium sibiricum *L.*
P Erodium Stephanianum *Willd.*
M Oxalis corniculata *L.*
M Averrhoa Carambola *L.*
P Tribulus terrestris *L.*
M Ruta angustifolia *L.*
M Zanthoxylon Avicennæ *DC.*
P Xanthoceras sorbifolia *Bunge.*
P Ailantus glandulosa *Desf.*
M Brucea sumatrana *Roxb.*
M Melia Azedarach *L.*
P Cedrela sinensis *Juss.*
M Mangifera indica *L.*
M Rhus succedanea *L.*
P R. Cotinus *L.*
M Sageretia theezans *Brongn.*
P Sophora flavescens *Ait.*
M Crotalaria albida *Heyne.*
M Indigofera hirsuta *L.*
P I. Bungeana *Steud.*
P Melilotus parviflora *L.*
P Caragana frutescens *DC.*
M Glycyrrhiza echinata *L.*
M Tephrosia purpurea *Pers.*
M Alysicarpus vaginalis *DC.*
P Guldenstædtia pauciflora *Fisch.*
P G. multiflora *Bunge.*
P Oxytropis hirta *Bunge.*
M Desmodium gangeticum *L.*
M D. polycarpum *DC.*
M D. pulchellum *Benth.*
M D. latifolium *DC.*
M D. triquetrum *DC.*
M Uraria crinita *Desv.*
M Lespedeza trichocarpa *Pers.*
M Atylosia scarabæoides *Benth.*
M Cajanus hicolor *DC.*
M Cassia Tora *L.*
M C. mimosoides *L.* (forma microphylla).
M Acacia Farnesiana *Willd.*
M Albizzia Julibrissin *Boiv.*
M Tamarindus indica *L.*
M Guilandina Bonducella *L.*
P Spiræa trilobata *L.*
P Potentilla chinensis *Ser.*
P P. fragarioides *L.*
P P. supina *L.*
M Eriobotrya japonica *Lindl.*
M Saxifraga sarmentosa *L.*
P Deutzia parviflora *Bunge.*
P D. grandiflora *Bunge.*
P Lagerstrœmia indica *L.*
M Jussiæa villosa, *Lam.*
M Candelia Rheedii, *Arnott.*
M Eugenia Jambos, *L.*
M Syzygium sp.
M Psidium Guijava *L.*
M Coccinia grandis *Cogn.*
P Siler divaricatum *Benth. & Hook. f.*
M Paratropia cantoniensis *Hook. & Arn.*
P Sambucus racemosa *L.*
P Viburnum fragrans *Bunge.*
M Mussænda pubescens *Ait.*
M Ixora stricta *Roxb.*
M Psychotria Reevesii *Wall.*
M Pæderia fœtida *L.*
M Oldenlandia paniculata *L.*
M Borreria stricta *L.*
P Rubia cordifolia *L.*
M Vernonia cinerea *Less.*
M V. chinensis *Less.*
M Elephantopus scaber *L.**

M Eupatorium Reevesii *Wall.**
P Aster altaicus *Willd.*
P A. integrifolius (Calimeris integrifolia *Turcz.*; Boltonia pekinensis *Hance*).
M Conyza ægyptiaca *L.*
P Inula Britannica *L.* (typica).
P Xanthium Strumarium *L.*
M Eclipta alba *L.**
M Wedelia calendulacea *Less.**
M Wollastonia biflora *DC.**
M Siegesbeckia orientalis *L.**
M Bidens pilosa *L.*
M Pyrethrum indicum *Cass.*
M & P Artemisia annua *L.*
P A. scoparia *W. & K.*
P A. indica *L.*
P A. Sieversiana *Willd.*
M Carpesium abrotanoides *L.*
M Gynura pseudochina *DC.*
P Senecio glabellus *DC.*
P S. Kirilowii (Cineraria Kirilowii *Turcz.*).
P Cnicus segetum (Cirsium segetum *Bunge*).
P Rhaponticum uniflorum *DC.*
P Myripnois dioica *Bunge.*
P Anandria Bellidiastrum *DC.*
P Lactuca denticulata *Maxim.*
P L. versicolor *Maxim.*
P Rhododendron micranthum *Turcz.*
P Androsace saxifragæfolia *Bunge.*
P Lysimachia barystachys *Bunge.*
P Fraxinus rhynchophylla *Hance.*
P Jasminum Sambac *L.*
P Gentiana squarrosa *Ledeb.*
P Syringa villosa *Vahl.*
P S. amurensis *Rupz.*, *var.* pekinensis *Max.*
M Apocynum venetum *L.*
P Periploca sepium *Bunge.*
P Vincetoxicum sibiricum *Decaisne.*
M Cynanchum pubescens *Bunge.*
P Rehmannia glutinosa *Lib.*
P Incarvillea chinensis *Juss.*
M Convolvulus arvensis *L.*, *var.* sagittatus *Ledeb.*
M Ipomæa reptans *Poir.*
M I. sp., near I. chryseidis *Ker.*
P Tournefortia Arguzia *R. & S.*
P Eritrichium pedunculare *A. DC.*
P Bothriospermum chinense *Bunge.*
P Lycium chinense *Mill.*
P Solanum nigrum *L.*
P S. septemlobum *Bunge.*
M S. Melongena *L.*
P Physalis Alkekengi *L.*
M Capsicum conoides *Mill.*
M Herpestes Monniera *H. & K.*
M Vandellia sp.
M Siphonostegia chinensis *Benth.*
M Dicliptera cardiocarpa *Nees.*
M D. cuneata *Nees.*
P Vitex incisa *Lam.*
P Orobanche ammophila *Mey.*
M Ocimum basilicum *L.*
M O. sanctum *L.*
M & P Perilla ocimoides *L.*
M Mentha arvensis *L.*
M Anisomeles ovata *Br.*, *β.* mollissima *Benth.*
P Salvia miltiorhiza *Bunge.*
M Scutellaria indica *Bunge.*
P Marrubium incisum *Bunge.*
P Leonurus sibiricus *L.*
P Polygonum orientale *L.*
M P. chinensis *L.*
P Chenopodium viride *L.*
P Kochia scoparia *Schrad.*
P Salsola Kali *L.*
M & P Amaranthus ascendens *Lois.*
M A. melancholicus *L.*
M Aerva lanata *Juss.*
M Cyathula prostrata *Blume.*
M Alternanthera sessilis *Br.**
M Celosia cristata *Moq.**
M Achyranthes aspera L.
M Cassytha filiformis *L.*
P Elæagnus angustifolia *L.*
P Diarthron linifolius *Turcz.*
P Euphorbia humifusa *Willd.*
P E. lunulata *Bunge.*

M E. Tirucali *L.*
M E. pilulifera *L.**
M Dalechampia parvifolia *Lambk.*
M & P Acalypha pauciflora *Horn.*
P Andrachne chinensis *Bunge.*
P Broussonetia papyrifera *Vent.*
P Cannabis sativa *L.*
M Artocarpus Jaca *Lam.*
M Fatoua pilosa *Gaud.*, *β.* subcordata *Bur.*
M Pouzolzia indica *Gaud.*, forma microphylla.
M Ficus erecta *Thunb.*
M F. pertusa *L.*
M F. sp. (F. pumilæ *Thunb.* aff.)
M F. sp. (F. rufescenti *Vahl.* aff.)
M F. sp. (F. indicæ *L.* aff.)
M Biota orientalis *Endl.*
M Cycas revoluta *Thunb.*
P Cypripedium macranthum *Sw.*
M Amomum Zingiber *L.*
M Alpinia Galanga *Sw.*
P Iris oxypetala *Bunge.*
P Pardanthus dichotomus *Ledeb.*
P Polygonatum sp. (P. officinale *L.?*)
P P. chinensis *Kunth.*
P Asparagus trichophyllus *Bunge.*
P A. lucidus *Lindl.**
M Lilium tenuifolium *Fisch.*
P Funkia subcordata *Spreng.*
P Commelina communis *L.*
M C. benghalensis *L.*
M Pothos scandens *L.*
M Cyperus Iria *L.*
M C. distans *L.*
P Carex stenophylla *Wahl.*
M Oryza sativa *L.*
P Panicum viride *L.*
P P. glaucum *L.*
M P. compositum *L.*
M P. sanguinale *L.*
P P. Crus-galli *L.*, *var.* muticum.
P P. miliaceum *L.*
P P. italicum *L.*
M Isachne sp.
P Paspalum villosum *Thunb.*
P Hierochloa dahurica *Trin.*
M Chloris caudata *Trin.*
P Poa pilosa *L.*
P P. megastachya *Link.*
M P. tenella *L.*
M P. unioloides *Retz.*
M Eleusine indica *L.*
M Dactyloctenium ægyptiacum *Willd.*
P Melica scabrosa *Trin.*
M Bambusa sp.
M Apluda mutica *L.*
M Andropogon Schœnanthus *L.*
P A. Sorghum *Brot.*
P Selaginella mongolica *Rupr.*
P S. Stauntoniana *Spring.*
M Davallia tenuifolia *Sw.*
M Adiantum caudatum *Hook.*
M A. flabellulatum *L.*
M Blechnum orientale *L.*
M Pteris semipinnata L.
M Asplenium sp.
M Aspidium molle *Sw.*
M A. sp.
M Polypodium adnascens *Sw.*
M Tænitis blechnoides *Sw.*
M Lygodium japonicum *Sw.*
M Angiopteris evecta *Hoffm.*

ON THE FLORA OF THE UPPER TAMAR AND NEIGHBOURING DISTRICTS.

By the Rev. W. Moyle Rogers, F.L.S.

The following notes embody the chief results of a season's botanizing in a neighbourhood quite new to me. No stations are given but those in which the plants referred to were seen in 1882, either by myself, or by my friend Mr. T. R. Archer Briggs, who during a week's stay at my house in August explored much of the country and added greatly to my knowledge of its Flora.

The parts most examined are the river valley in my own immediate neighbourhood at Bridgerule, and the coast about Bude where I spent three weeks in July. But it seems best to divide the whole country treated of into four districts as follows :—

I. The seaboard from the N. W. boundary of Cornwall at Morwinstow to Tintagel; with the road along the high ground from Launceston to Kilkhampton as eastern limit.

II. The valley west of the Tamar, from its source to Launceston, including both sides of the Launceston and Kilkhampton Road.

III. The country east of the Upper Tamar and drained by its affluents, extending nearly to Okehampton.

IV. The Okement and Upper Taw.

I. and II. are in E. Cornwall; III. and IV. in N. Devon.

Three interesting papers on the Flora of I. and II. by the Rev. Dr. Hind and Messrs. J. G. Baker and T. R. A. Briggs, respectively will be found in this Journal for 1873, pp. 36–43, 97–101. What I now contribute is supplemental to what appears in these papers. Indeed all the actual stations named here are, I believe, additional to those hitherto published; except in the few instances in which the name of the earlier recorder is found in brackets after the station.

The Tamar divides the parish of Bridgerule into Bridgerule West and Bridgerule East. Hence the frequent occurrence in these notes of "Bridgerule' in two of the districts (II. and III.), in Cornwall and Devon respectively.

By "New record is meant a species not hitherto recorded for the vice-county, so far as I can ascertain.

Clematis Vitalba L.—I. Near Bude, on the Stratton Road, for a short distance. Between Poughill and Stratton, occasionally. Very local, but apparently native.

Ranunculus peltatus Fries.—II. In the canal at Bridgerule. III. Bridgerule mill stream. a. *truncatus*, I think, in both places. New record for both vice-counties.

R. diversifolius Gilib., a. *radians*.—I. In the Poughill stream, not far from the sea, on Summerleaze Down. New record.

R. Lenormandi F. Schultz.—III. Bridgerule and Pyworthy. Frequent in ditches and pools. IV. Okehampton, in great quantity on the hill south of the Railway Station.

R. Flammula L., b. *pseudo-reptans*.—IV. By rill on hillside near Okehampton.

R. parviflorus L.—I. Bude, on Summerleaze Down. II. Bridgerule, at Newacott and Littlebridge.

Helleborus viridis L.—III. Bridgerule Vicarage Plantation. No doubt planted.

Aquilegia vulgaris L.—I. Marhamchurch. III. Bridgerule. Very local, and perhaps only as a denizen.

Papaver somniferum L.—I. Bude, in cornfield and on hedgebanks near, in considerable quantity. Casual, with *P. Lamottei*.

P. Rhæas L.—I. Near Bude, on a wall and on hedgebanks, in small quantity. Near Stratton, in corner of grass field and in a kitchen garden. Marhamchurch, in a turnip field, in plenty, and in a farmyard, two or three plants. Trevalga, a few plants, here and there by roadside. Very local. Looked for in vain in II., III. and IV.

P. dubium L.—I. About Bude, rather frequent; both a. *Lamottei* and b. *Lecoqii*.

Fumaria confusa Jord.—I. Bude. Boscastle. II. and III. Bridgerule. The only *Fumaria* seen.

Sinapis nigra L.—I. Bude. Lanes near Stratton and Marhamchurch. Boscastle. Rare.

Brassica Rapa L., c. *Briggsii*.—I. Near Boscastle, in two or three spots on the cliffs. II. Bridgerule "Allotment," among potatoes, &c., abundant.

Diplotaxis muralis DC.—I. Poughill. Its abundance about Bude (Hind) is remarkable.

Barbarea præcox Br.—I. Marhamchureh, in a lane east of the village. Apparently a much rarer denizen than in S. Devon.

Cochlearia officinalis L., a. *littoralis*.—I. Sandymouth. Bude. Widmouth. Rather common. III. Neár Holsworthy (about nine miles from the sea) on hedgebanks round a kitchen garden and on the opposite side of the road; established in extraordinary quantity.

C. danica L.—I. Bude. Widmouth. Boscastle. Much the commoner species.

Draba verna L.—I. Summerleaze Down. Type and b. *brachycarpa*. Apparently rare.

Alyssum maritimum Lam.—I. Bude, on wall by canal, a plant or two at intervals. Garden escape.

Lepidium Smithii Hook.—I., II. and III. frequent.

Viola palustris L.—IV. Okehampton, on hill south of Railway Station, in great quantity.

V. odorata L.—II. and III. Bridgerule. Rare, and only near houses or gardens.

V. hirta L.—I. Near Bude.

Drosera rotundifolia L.—I. Marshy common between Wainhouse Corner and Tresparrot. III. Bridgerule Bog. Near Dunsland Cross, by road to Okehampton.

Moenchia erecta Sm.—IV. Hillside south of Okehampton. New record.

Cerastium tetrandrum Curt.—I. Bude (Hind) and Widmouth. Seen only near the sea.

C. semidecandrum L.—Summerleaze Down, local.

Stellaria media With., b. *Boræana*.—I. With the last on Summerleaze Down. d. *umbrosa*, III. Bridgerule; very local.

S. uliginosa Murr.—II. and III. Bridgerule; frequent. IV. About Okehampton.

Arenaria serpyllifolia L.—I. Bude; stout sandhill form very common. Near Stratton. b. *leptoclados*. IV. Near Okehampton. Both type and var. b. are remarkably infrequent, if not (as it appears to me) quite rare.

Sagina apetala L.—I. Bude. Stratton (Hind) churchyard. Marhamchurch. Rare.

S. ciliata Fries.—IV. Near Okehampton Railway Station.

S. subulata Wimm.—IV. Hillside south of Okehampton. Belstone Cleave.

S. nodosa Meyer.—I. Bude (Hind), on Efford Down, in bare spots. II. Bridgerule, canal banks, very abundant. Queried for E. Cornwall in "Topographical Botany."

Spergulaia rubra Fenzl.—II. Quarry near St. Stephen's

S. neglecta Syme.—I. Bude:—on Efford Down in bare spots; in the salt marsh between canal and river, common; as well as, more sparingly, on the beach (Baker).

S. rupestris Lebel.—I. Rocks at Sandymouth, Boscactle and Tintagel.

Hypericum Androsæmum L.—I. II. and III. Generally distributed, and more frequent than I remember to have seen it in any other neighbourhood. IV. Near Okehampton.

H. dubium Leers.—II. and III. Bridgerule; by canal and river and in hedges near them, rather frequent.

H. bæticum Boiss.—I. Between Marhamchurch and Burrow. About Tackbear. Between Whitstone and Widmouth Bay. Between Wainhouse Corner and Tresparrot. II. Ditches near Redpost. Bridgerule, by canal. III. Bridgerule; in boggy ground and wet bushy ditches, frequent. Pyworthy; in damp pasture below village towards the Launceston Road and in ditch near Holsworthy and Bude Road. Near Dunsland Cross Railway Station. New record for N. Devon, but also reported to me by Mr. H. A. Evans from the Westward Ho neighbourhood early in the summer. More frequent in this part of the country, in Mr. Briggs' opinion, than in the Plymouth neighbourhood.

H. humifusum L.—I. Bude. Near Boscastle and St. Knighton's Kieve. II. and III. Bridgerule. IV. Okehampton. Belstone Cleave. Uncommon.

H. Elodes L.—I. Between Wainhouse Corner and Tresparrot. III. Bridgerule Bog and Bridge Moor. IV. Near Okehampton.

Lavatera arborea L.—I. Bude, by river and canal. No doubt planted.

Radiola Millegrana Sm.—III. Pyworthy, Launceston Road. IV. Belstone Common.

Linum angustifolium Huds.—I. Sandymouth. Bude. Between Bude and Marhamchurch. Widmouth. Boscastle. II. Bridgerule. III. Bridgerule. Lifton. Fairly frequent, but usually in small quantity.

Geranium pyrenaicum L.—I. Bude, one large plant in the middle of a grass field, at the back of the town. Denizen.

G. pusillum L.—I. On Summerleaze Down, Bude, apparently in small quantity.

G. columbinum L.—I. Cliffs above Sandymouth. North-east corner of Summerleaze Down. III. Roadside between Lifton and Bridestowe. Rare. Much of the country seems too wet for this species.

Erodium cicutarium L'Herit.—I. Bude (Hind) and Widmouth, in plenty.

E. moschatum L'Herit.—I. Poughill village, on a garden wall. On Summerleaze Down, especially towards the north-east; in great quantity and unmistakably native.

E. maritimum Sm.—I. Willa Park Point. Tintagel.

Oxalis Acetosella L.—I. St. Knighton's Kieve. II. and III. Bridgerule. IV. About Okehampton.

Euonymus europæus L. — I. Stibb. Bude. Marhamchurch. Occasional. II. Bridgerule, by canal. III. Tetcott. Apparently quite rare, except on the seaboard.

Rhamnus Frangula L.—II. Whitstone and Week St. Mary. III. Bridgerule and Pyworthy, rather frequent. Between Lifton and Bridestowe. IV. About Okehampton.

Acer campestre L.—I. Between Stratton and Launcells. Near Widmouth, on the Marhamchurch Road. Very rare; but, I think, clearly native in warm sheltered spots.

Genista anglica L.—I. Between Tackbear farm and the Widmouth Road. II. By Canal, north and south of Bridgerule. III. Bridgerule, on Dux Common and Bridge Moor. Locally abundant.

G. tinctoria L.—II. Between canal and river south of Bridgerule, in good quantity. New record.

Sarothamnus scoparius Koch. — II. Between Whitstone and Wilsworthy Moor. Only one bush seen. IV. Between Okehampton and Sticklepath, in some quantity.

Anthyllis Vulneraria L.—I. Cliffs from Sandymouth to Widmouth, in greatest profusion. Usually dwarf and varying extremely in colour of flowers.

Trifolium medium L.—The extraordinary abundance of this species in I. II. and III. constitutes quite a marked feature in the Flora.

T. arvense L.—I. Willa Park Point.

T. striatum L.—I. On dry bank in road east of Stratton.

T. scabrum L.—I. Very common on cliffs from Sandymouth to Widmouth.

T. hybridum L.—Very generally established in fields and by roadsides.

T. fragiferum L.—I. Summerleaze Down. Roadside between Burrow and Marhamchurch. Lacks personal authority for E. Cornwall in 'Topographical Botany.'

T. filiforme L.—II. Between Launcells and Bridgerule. III. Meadow by the river at Bridgerule.

Lotus tenuis Kit.—I. Roadside between Burrow and Marhamchurch.

Ornithopus perpusillus L.—I. Willa Park Point. II. Quarry near St. Stephen's. IV. Belstone Cleave.

Orobus tuberosus L.—Remarkably abundant, especially in III. Var. *tenuifolius* is frequent.

Vicia tetrasperma Mœnch.—I. About Bude. II. Marhamchurch. Werrington. III. Lifton. Apparently rather local.

(To be continued).

NOTES ON BRITISH *CHARACEÆ*.

By Henry & James Groves.

The following notes are the result of the examination of specimens, which have passed through our hands, during the past year. The most important additions to our previous records are *Nitella mucronata* from Beds., *Chara tomentosa* from Norfolk, *C. baltica* from Dorset, and *C. tenuissima* from Anglesea.

We would thank our correspondents for the many specimens which they have given us the opportunity of examining. We are especially indebted to Mr. Arthur Bennett for the large number received from him. In cases where more than one specimen of a species has been received from the same county, the earliest collected has been used.

Much still remains to be done in working out the distribution of our *Characeæ*. Of the 71 botanical counties in England and Wales there are 19 from which we have not been able to record a single species, from the 41 Scottish counties 21, and from the 37 Irish counties 21. We shall therefore be very glad to see any specimens that may be collected, in order as far as possible to complete the census.

A list of the species has been added, with the number of counties and vice-counties from which we have seen specimens.

Chara fragilis, Desv.—Kent E., 1881, *E. Straker*, comm. *A. Bennett*; Cambs., 1827, *M. J. Berkeley*; Beds., 1882, *J. Saunders*; Hereford, 1870, *Augustin Ley*; Leicester, 1878, *F. T. Mott*; Yorks. N. W., 1881, *G. Nicholson*; Durham, 1861, *A. M. Norman*; Northumberland S., *J. Storey*; Kirkcudbright, 1850, *P. Gray*; Edinburgh, 1872, *A. Craig-Christie*; Perth, Mid, 1881, *R. Kidston*; Perth, E. 1882, *A. Sturrock*, comm. *A. Bennett*; Forfar, *Hb. P. Gray*; Clyde Isles, 1875, *A. Craig-Christie*; Sutherland W., 1881, *W. F. Miller*, comm. *A. Bennett*; Caithness, 1881, *J. Grant*, comm. *A. Bennett*; Orkney, 1881, *W. I. Fortescue*; Galway, E., 1881, *Bolton King*; Mayo, W., *Hb. Dyer*; Channel Islands, *Salwey*, *Hb. Kew*.

var. *barbata*.—Radnor, 1881, *Augustin Ley*; Stirling, 1881, *R. Kidston*.

var. *capillacea*.—Cornwall, W., near Land's End, 1877, *W. B. Waterfall*.

var. *Hedwigii*.—Kent. W. *Hb. A. G. More*; Middlesex, 1882, *H. G.*; Suffolk, W., 1881, *W. M. Hind*, comm. *A. Bennett*; Beds., 1881, *J. Saunders*; Dumfries, 1850, *P. Gray*.

var. *delicatula*.—Kirkcudbright, 1882, *J. McAndrew*, comm. *A. Bennett*; Aberdeen S., Braemar, 1831, *Herb. Greville*; Orkney, Loch of Harray, 1881, *H. H. Johnston*.

C. ASPERA, Willd.—Dorset, Studland, 1881, *H. T. Mennell*, comm. *A. Bennett*; Cardigan, Borth, 1881, *E. Straker*, comm. *A. Bennett*; Sutherland, W., Badcall, 1881, *W. F. Miller*, comm. *A. Bennett*; Orkney, Loch of Harray, &c., 1881, *H. H. Johnston*; Down, Clandeboye Lake, 1882, *S. A. Stewart*.

var. *subinermis*.—Dorset, Studland, 1874, *J. C. Mansel-Pleydell*; Cardigan, Borth, 1881, *E. Straker*, comm. *A. Bennett*.

C. POLYACANTHA, Braun.—Anglesea, 1881, *J. E. Griffith*, comm. *A. Bennett*; Cumberland, near Penrith, 1882, *W. Hodgson*, comm. *A. Bennett*; Roxburgh, Kippilan Pond, 1882, *A. Brotherston*.

C. BALTICA, Bruz.—Dorset, Studland, 1870, *J. C. Mansel-Pleydell*. This differs from the Cornish variety by its more rigid habit, smaller size and usually solitary spine-cells.

C. CONTRARIA, Kuetz.—Dorset, Studland, 1881, *H. T. Mennell*, comm. *A. Bennett*; Warwick, Stoke Heath Canal, 1881, *J. E. Baynall*; Anglesea, Coron Lake, 1881, *J. E. Griffith*, comm. *A. Bennett*; Lancs., S., Southport, 1882, *H. Searle*, comm. *A. Bennett*; York, M. W., Kippax, 1834, *Hb. Edinburgh*; Haddington, Guillone Links, 1881, *W. F. Miller*, comm. *A. Bennett*.

C. HISPIDA, L.—Sussex, E., 1873, *F. C. S. Roper*; Bedford, 1882, *J. Saunders*; Durham, *A. M. Norman*, *Hb. Watson*; Northumberland, S., *R. B. Bowman*, *Hb. Watson*; Perth, E., 1882, *A. Sturrock*, *Hb. A. Bennett*.

var. *rudis*.—Yorks. N. E., Scarborough Mere, 1882, *Wheldon*, comm. *A. Bennett*.

C. VULGARIS, L.—Dorset, 1881, *H. T. Mennell*, comm. *A. Bennett*; Hants., N., 1882, *Bolton King*; Bucks., 1882, *G. Nicholson*; Gloster, W., *W. B. Waterfall*; Hereford, 1879, *Augustin Ley*; Stafford, 1881, *J. G.*; Salop, 1882, *Augustin Ley*; Yorks., N. W. *Hb. Kew*; Northumberland, S., *R. B. Bowman*; Sutherland, W., 1833, *Hb. Greville*; Caithness, 1852, *P. Gray*; Channel Islands, 1880, comm. *A. Bennett*.

var. *longibracteata*.—Cornwall, W., 1878, *J. Cunnack*; Dorset, 1875, *J. C. Mansel-Pleydell*: Sussex, E., 1874, *F. C. S. Roper*; Suffolk, E., 1874, *F. J. Hanbury*; Beds., 1882, *J. Saunders*; Hereford, 1882, *Augustin Ley*; Warwick, 1882, *J. E. Baynall*.

var. *atrovirens*.—Orkney, Swanbister, *H. H. Johnston*.

var. *crassicaulis*.—Cambs., Burwell, 1882, *H. & J. G.*

TOLYPELLA NIDIFICA, Leonh.—Braun in 'Fragmente einer Monographie der Characeen,' p. 94, describes the plant collected in Loch Neagh, near Langford Lodge, by Dr. Moore in 1840, as the var. *intermedia* of this species. When writing our "Review" we thought it better to await further material in consequence of the doubtful character of the specimens. Braun's first opinion was "Habitus et folia omnino *nidifica*, sed seminibus minoribus magis

contortis accedit ad *C. fasciculatam*" (see Exchange Club Report, 1867, p. 15).

T. GLOMERATA, Leonh.—Cambs., Wicken and Bottisham Fens, 1882, *H. & J. G.*; Anglesea, Lyn Coron, *Hb. Borrer*; Lancs., S., Southport, 1881, *J. H. Lewis*; Yorks., S. W., Goole, 1882, *T. Birks, Jr.*

T. INTRICATA, Leonh.—Yorks., S. W., Goole, 1882, *T. Birks, Jr.*

NITELLA TENUISSIMA, Kuetz.—Norfolk, W., Roydon Fen, *Hb. Borrer.* (No county being given we had passed this over as Cambridgeshire until pointed out to us by Mr. Bennett.) Anglesea, 1882, *J. E. Griffith*, comm. *A. Bennett.*

N. MUCRONATA, Kuetz.—Beds., near Bedford, 1882, *C. H. Davis.* We are indebted to Mr. Saunders for specimens of this plant, which is especially interesting as it has not been found in England since Mr. Borrer collected it in Sussex.

N. TRANSLUCENS, Ag.—Devon, S., 1880, *W. M. Rogers*; Perth, E., 1882, *A. Sturrock*, comm. *A. Bennett*; Antrim, 1882, *S. A. Stewart.*

N. FLEXILIS, L.—Suffolk, E., *D. Turner*, *Hb. Kew*; Hereford, 1873, *Augustin Ley*; Lancs., S., 1882, *H. Searle*, comm. *A. Bennett*; Yorks., S. W., 1879, *F. T. Mott*; Yorks., N. W., 1833, *J. Ward*; Kirkcudbright, 1850, *P. Gray*; Perth, E., 1882, *A. Sturrock*, comm. *A. Bennett.*

var. *crassa*, Braun, R. & S. Exs. No. 101 (1877). Differs from the type by its much stouter stems and branchlets, and shorter end-segments; much resembling *N. translucens*, from which it may be distinguished by its end-segments consisting of one cell only, and by the absence of the bright shining green colour which characterises *N. translucens.* It occurs in lochs, &c., in deep water, and sometimes attains a height of 4–5 feet.—Perth, W., Watson Loch, Doune, 1881, *A. Craig-Christie*; Perth, E., Marlee Loch, 1882, *A. Sturrock*, comm. *A. Bennett.*

var. *nidifica*, Wallm. Act. Stockh. 1852 (1854), p. 262. Fertile branchlets very short, forming compact heads. Sterile branchlets often simple. A much more extreme form than var. *subcapitata*, Braun, which does not seem worth distinguishing from the type. —Perth, E., Marlee Loch, 1882, *A. Sturrock*, comm. *A. Bennett.*

N. OPACA, Ag.—Kent, E., 1881, *E. Straker*, comm. *A. Bennett*; Essex, S., 1880, *E. Dadswell*; Herts., 1881, *T. B. Blow*; Beds., 1882, *J. Saunders*; Staffs., *C. C. Babington, Hb. Kew*; Carnarvon, *W. Wilson, Hb. Kew*; Anglesea, 1882, *J. E. Griffith*, comm. *A. Bennett*; Derby, 1862, *W. H. Purchas*; Chester, 1882, *C. Bailey*; Yorks., S. W., 1882, *T. Birks, Jr.*; Northumberland, S., 1848, *D. Oliver*; Kirkcudbright, 1850, *P. Gray*; Edinburgh, 1881, *J. McFarlane*; Perth, W., 1881, *A. Craig-Christie*; Perth, Mid, 1881, *R. Kidston*; Easterness, 1882, *J. G.*; Sutherland, E., 1833, *Campbell, Hb. Watson*; Caithness, 1881, *J. Grant*, comm. *A. Bennett.*

List showing the number of Counties and Vice-counties from which specimens have been seen :—

CHARA		LYCHNOTHAMNUS	
fragilis	59	alopecuroides	1
fragifera	1	TOLYPELLA	
connivens	2	glomerata	12
aspera	22	prolifera	2
polyacantha	7	intricata	6
baltica	2	NITELLA	
contraria	11	tenuissima	3
hispida	33	gracilis	3
vulgaris	53	mucronata	2
tomentosa	3	translucens	17
canescens	2	flexilis	19
obtusa	1	opaca	50

ON THE FLORA OF INNISHOWEN, CO. DONEGAL.

By H. C. Hart, B.A.

INNISHOWEN, the north-east part of Co. Donegal, is a well-marked and naturally defined division of the county. It lies between Loughs Foyle and Swilly, running northwards to Malin Head, the extreme northern part of Ireland in latitude 55° 23′, while it is bounded by a line drawn irregularly across the narrowest part of the neck of land between the upper parts of the two loughs. The district under consideration thus includes about half the eastern boundary of the county, as well as the extreme northern parts. It is composed of three baronies—East Innishowen, West Innishowen, and the north-west Liberties of Derry or Templemore, which was formerly a part of Innishowen, and is so geographically, being included in the Donegal province by the author of the 'Cybele Hibernica.' The total area of Innishowen is three hundred and eighteen square miles.

Innishowen extends from its most southern part along the Foyle below the point of junction of the three counties, Derry, Tyrone and Donegal, to Malin Head due north, a distance of thirty-one miles; while its greatest width from Innishowen Head on the east to Dunree on the west is twenty-five miles. Its shape is roughly that of a boy's kite, lying evenly north and south. The geological structure of Innishowen is of Cambrio-Silurian age, with much quartzose and gneiss, the latter probably of Laurentian age. Granite occurs at Dunaff Head chiefly, and trap rocks are represented there also and more abundantly near Buncrana, while in the main part some of the mountains, as Bulbein, expose sections of schist, shales, and impure limestone. There is little limestone, and the prevalence of that most barren of all rocks, quartzose, is detrimental to the vegetation, especially in the western mountainous margin bounded by Lough Swilly, which would otherwise, no

doubt, contain a good alpine flora. The surface of the country is for the most part mountainous, a raised table-land, with outer mountains and many valleys penetrating far, giving slopes and lower levels, which afford rich agricultural districts. The mountains find their highest point in Slieve Snacht, 2019 feet; Rachtinmore, 1657 feet; and Bulbein Mount, 1650 feet. Cultivation extends up to about 750 or 800 feet in favoured places, as on the southern slopes of The Scalp. There are several mountain lakes, some considerable estuaries, with salt-marshes and low muddy flats. Two of these estuaries, those of Malin and Culdaff, partly separate the extreme peninsula of Malin from the mainland, and with this outer headland I have dealt separately.

The coast-line of Innishowen is in many parts wild and magnificent; from Glengad Head to Stook-a-ruddan a fine series of precipitous headlands faces the sea, and the walk from Culdaff to Malin Head, which included this coast, was one well worth the labour. The rugged boldness of Malin Head itself should be seen in a storm to be properly appreciated; nevertheless, there is one inlet west of the Signal-tower which gives an idea, even in a calm, of the terrible force of the Atlantic "cataract sea." In the water stand dislodged pinnacles of rock, while around and above freshly-fallen or tottering boulders give the place an appearance as if it had been recently shelled or blasted. There is one headland at the entrance of Lough Swilly, Dunaff Head, which, though scarcely 700 feet high, is, in my opinion, the most fascinating bit of sea-cliff scenery in Ireland. In variety of shape, sheerness of descent, with grand and picturesque grouping and surroundings, I have found nothing to surpass it.

I have endeavoured to show that the surface of Innishowen is of very varied character, and well adapted for sheltering plants whose requirements are widely different; and I trust that I shall be able to prove that the flora is a highly interesting one. Apart from its importance geographically, in studying the distribution of Irish plants, the occurrence of several very rare and local species renders it doubly attractive. A separate list of them, which are chiefly alpine and northern, will be given later on.

Innishowen has attracted many botanists. The illustrious Robert Brown visited it in his earlier days. Subsequently to him, Dr. Dickie, Dr. Moore, and Mr. Charles Moore all paid attention to it, and from their records in the 'Flora of Ulster,' compiled by Dr. Dickie,—a list given in the Ordnance Survey Report of plants found in the parish of Templemore, about Derry, by Dr. Moore, has been also referred to,—and the 'Cybele Hibernica,' by Dr. Moore and A. G. More, much information has been derived. I am also indebted to the recent observations of my cousin, W. E. Hart, of Kilderry, for many notes of the plants about Greencastle; a list which he has supplied me with those in that neighbourhood and about Glenagivney and Moville, Fahan and Kilderry, being frequently quoted from in the following pages.

My own observations were made through a series of years during numerous visits to the western parts of Innishowen from

Lough Swilly; while in the present year I examined the coast-line from Greencastle to Binnion, a little east of Dunaff, as well as botanising the mountain lakes and moors, exploring the higher mountains, and making a detailed examination of the estuaries, swamps, and reclaimed lands in the neighbourhood of Inch Island and Blanket Nook. A visit to Innishtrahull was unfortunately hindered by rough weather, but Dr. Dickie has given an estimate of the flora of that remote island, which proves it of no special interest.

Several parts of Innishowen may, perhaps, require further examination, and for some, especially those in the immediate neighbourhood of Derry, I am relying upon the observations of other botanists. Moreover, I have seldom had opportunities of spring visits; thus my list is perhaps deficient in some of the earlier grasses, sedges, and orchids. But the labours of Drs. Dickie and Moore no doubt cover many of these supposed gaps, and my information is, I believe, on the whole sufficient to give a good, if not an exhaustive, account of the plants. Fifteen, or at the most I should think twenty, species, unrecorded here, may yet probably be found. The present paper, as well as others written by me for this Journal, may be regarded as being a portion of what it is my hope in time to complete, a Flora of the County Donegal; and having this in mind I have no hesitation in offering it for publication.

I will first give a list of the rarest species occurring; localities will be found in the systematic list.

Corydalis claviculata.
Draba incana.
Crambe maritima.
Silene acaulis.
Ligusticum scoticum.
Sium latifolium.
Saussurea alpina.
Bartsia viscosa.
Calamintha Clinopodium.
Mertensia maritima.
Polygonum viviparum.
Ceratophyllum demersum.
Poa compressa.
Elymus arenarius.
Equisetum umbrosum.

Of the above, *Corydalis* has been already recorded by W. E. Hart, but the record has not found its way into the pages of the 'Cybele Hibernica,' nor its Supplement. With regard to *Crambe*, I shall be more explicit, since it is a very rare plant, and has become extinct in several of its Irish localities. The record in the 'Cybele Hibernica' is "at Nonvany Point, in the parish of Clonmary, Donegal. Mr. Charles Moore." I was quite familiar with this record, and have always hoped, in my Donegal excursions, to discover Nonvany Point sooner or later. The name, however, not being known in Innishowen, either on the map or by the inhabitants, I believed it to be in some other part of the county; nor was it till my return this year that it occurred to me that "Clonmary" must be a misprint for "Clonmany," and "Nonvany" perhaps stand for "Norway," which is a name on the map near a point a little east of Dunaff Head, a point included in a space of about three miles, which I have never succeeded in reaching, but which I

shall make an early opportunity of examining. This mysterious point is twice subsequently quoted in the 'Cybele,' under *Ligusticum scoticum* and *Mertensia maritima;* and a station given under *Euphorbia portlandica*, "Rocks at Cockmany, Innishowen," is most likely referable to the same locality. *Sium latifolium* is included, since the locality given in the 'Cybele' is, properly speaking, in Innishowen, and belongs to District 11, not District 12.

(To be continued).

SHORT NOTES.

Epipogum aphyllum (Journ. Bot. 1882, p. 367).—The station for this plant near Ludlow is in Herefordshire, not Shropshire. It is not found in a new county as yet. I know where the wood is situated, but do not mean to publish it. There is sufficient reason for not doing so. We expect the plant to be found some time in other damp woods in that district.—C. C. Babington.

Phyllody of the bracteoles in Œnanthe crocata.—A root of this plant was found last August by Mr. E. F. Cooper of this town, on the shore of Ennerdale Water, Cumberland, bearing flowers of a very abnormal appearance. On examination I find the umbels small and about 12-rayed, the umbellules only about one-third of an inch in diameter; bracts few and small, but bracteoles abnormally developed, from one to three of those on each umbellule being half to one inch long, narrowly obovate, spiculate, slightly glaucous and reticulate below, in fact precisely similar to what the ultimate divisions of the normal leaves would be if they were separated to the base of the leaflet. A few of these abnormal bracteoles are compound.—F. T. Mott.

Carduus lanceolato-crispus in Berks.—By the roadside between Marsham and Hilford I gathered, growing with typical *lanceolatus*, a thistle which was evidently a hybrid between that species and *C. crispus*. The anthodes, though smaller, were near those of *lanceolatus;* the spinous-tipped phyllaries were also very suggestive of *lanceolatus*, while the leaves in outline nearly resembled those of *crispus*, the armature in a few being, however, nearer *lanceolatus*. The whole plant was very variable.—G. C. Druce.

Carex axillaris Good., in West Thames Sub-province.—In Journ. Bot. 1871, p. 148, Oxfordshire is recorded for the above plant which Mr. H. Boswell found in Marston Lane, near Oxford; this spring while botanising between Bledlow and Chinnor I gathered it just in that county, as well as in Buckinghamshire, where it was associated with *C. remota*, *C. vulpina*, and *C. muricata*. Later in the season the Rev. F. Bennett and myself gathered it near Marsham, Berks, where it likewise grew with *C. remota*, &c. The last locality is especially interesting since it produces *Scirpus*

maritimus (as has already been recorded in this Journal for 1881, p .55), and *Apium graveolens*,—the last a new county record.—G. C. Druce.

Notices of Books.

Report on the Progress and Condition of the Royal Gardens at Kew during the year 1881. By Sir J. D. Hooker, Director. London: Clowes [Dec.] 1882.

As is always the case, the Kew Report contains a store of interesting and useful matter; and we give the name of the publisher in order that those who wish to learn more of its contents than our limited space will enable us to extract may know where to obtain the full text. The *résumé* of the progress of applied botany contained in its pages is, so far as we know, the only thing of its kind; and although its practical usefulness may be a little lessened by the late date of its publication, it is still indispensable to the economic botanist. A list of the exotic economic and medicinal plants cultivated under glass at Kew is appended; this will be very useful to those who wish to know which of such plants can be seen at Kew in a living state, and might well be reprinted for distribution or added to the Guide to the Gardens.

In this Journal for 1881 (p. 381) we referred to the publication of *nomina nuda* in the Kew Report for 1880, and expressed an opinion that such publication was "very reprehensible." Dr. Trimen (Journ. Bot., 1881, p. 239) demurred to this expression, stating that the names in question represented "the results of hard work at a troublesome set of plants" . . . . and that "no writer on the rubber-yielding species of *Landolphia* and *Willughbeia* could be justified in neglecting them." The Report now before us furnishes a curious comment upon this justification. Two of the new rubber-yielding plants were named (but not described) in the 1880 Report as *Chilocarpus flavescens* and *Willughbeia Burbidgei*. We are now told (Kew Report for 1881, p. 48) that the former "appears to be a true *Willughbeia*, and will find its place in the Flora [of British India] as *W. flavescens*; while the latter "turns out after comparison with authentic specimens of *W. firma*, Bl. . . . . to be identical with that species."* If our contention that the 1880 names "have no claim to recognition or adoption by future workers" be allowed, the erroneous determinations may pass unnoticed; but if Dr. Trimen's view be adopted, botanical nomenclature will be

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* The identifications here indicated are carried out in part ix. of the 'Flora of British India,' which has come to hand since the above remarks were written. But it is to be noted that while the former is cited as "*W. Burbidgei*, Dyer in Kew Gard. Rep. 1880, 44, 46," the latter is given as "*Chilocarpus flavescens*, Kew Gard. Report, 1880, 47," no authority being appended to the specific name. As we have before pointed out (Journ. Bot. 1882, p. 289, foot-note) no indication of the dual authorship of the Kew Report for 1880 is to be found in its pages—a circumstance which further complicates the difficulty of quoting its *nomina nuda* as authoritative. We note in passing that Sir Joseph Hooker, in the 'Flora,' uniformly adopts a new spelling—*Willoughbeia*—for the genus in question.

burdened with at least two names which are at once useless and misleading.

But this is not all. This 1881 Report is dated Jan. 1st, 1882. But in June 15th of the same year Mr. Dyer read a paper before the Linnean Society in which he described *Willughbeia Burbidgei* as a new species. Are we to conclude from this that Sir Joseph Hooker was wrong in reducing this plant to a synonym of *W. firma?* Looking at the two dates we should naturally suppose this to be the case; but the true explanation is we believe to be found in the fact that the Kew Report, though headed Jan. 1st, was not really written until late in the year. It may be well to point out that the true time of publication of these Reports will be found on the last page, where, in the Report in question, we find "12/82" as the date of printing. But surely these corrections and confusions are strong evidence that such publication of *nomina nuda* may fairly be called "very reprehensible."

New Books.—H. Solms-laubach, 'Die Herkunft, Domestikation, und Verbreitung des gewohnlichen Feigenbaum' (Göttingen, 1882).—K. W. van Gorkom, 'Handbook of Cinchona Culture' (translated by B. D. Jackson), (London, Trübner, 1882. £2).—J. D. Hooker, 'Flora of British India,' part ix. (*Vacciniaceæ—Apocynaceæ*), London, Reeve & Co. 10*s.* 6*d.* Dec. 1882. J. Rostafinski, 'Hydrurus i jengo pokrewiéstavo' (Krakow, 1882).—Fr. Schmitz, 'Diə Chromatophoren der Algen' (Bonn, Cohn).—G. v. Martens and C. A. Kemmler, 'Flora von Württemberg und Hohenzollern,' ed. 3. (Heilbronn, Henninger).—E. Stizenberger, 'Lichens Helvetici' (fasc. 1.)—(St. Gall, Zollikofer).—E. Cosson, 'Illustrationes Floræ Atlanticæ,' Fasc. i. (tt. 1–25), Paris, Sept. 1882.—J. Sachs, 'Vorlesungen über Pflanzer-physiologie' (2nd pt.) (Leipzig, Engelmann, 1882).— —Chaudē, 'La Théologie des Plantes' (Paris, Palmé, 1882).—M. Rietsch, 'Reproduction des Cryptogames' (Paris, Baillière, 1882).—G. Bernard, 'Champignons observés à La Rochelle,' 1 vol. and atlas. (Paris, G. Baillière, 1882).—H. Friend, 'A Glossary of Devonshire Plant-names.' London: Trübner. (English Dialect Soc.), 6s.

Articles in Journals.

Botanical Gazette (Nov.).—G. Engelmann, 'The black-fruited *Cratægi* and a new species' (*C. brachyacantha* Sarg. & Engelm.).—A. P. Morgan, 'A new *Polyporus*' (*P. reniformis*).

Botanische Zeitung (Nov.).—K. Goebel, 'Beiträge zur vergleichenden Entwickelungsgeschichte der Sporangien.'—R. Caspary, 'Zwei Schlangentannen (*Abies pectinata* DC. f. *virgata* Casp.).'—E. Bergmann, 'Untersuchungen über das Vorkommen der Ameisensaüre und Essigsäure in den Pflanzen und über die physiologische Bedeutung derselben im Stoffwechsel' (concluded).—W. Detmer, 'Uber Photoepinastie der Blätter.'—E. Godlewski, 'Ein neuer Athmungsapparat.' — L. Jurányi, 'Beiträge zur Kenntniss der Pollenentwickelung der Cycadeen und Coniferen.'—(Dec.). O. Loew, 'Ueber den Chemischen Charakter des lebenden Protoplasmas.'—

Id. & T. Bokorny, 'Kann fuchsinschweflige Säure als mikrochemisches Reagens auf Aldehyd benutzt werden?'—C. Fisch, 'Beiträge zur Entwickelungsgeschichte einiger Ascomyceten' (1 pl.).

Botaniska Notiser.—L. M. Newman, 'Studier öfver Skånes och Hallands flora.'—E. Ljungström, 'Om bladens bygnad hos några Ericineer.'—N. C. Kindberg, 'Om *Grimmia funalis*.'—Id., '*Campylopus Schimperi*' (in Scandinavia).

Bulletin of Torrey Botanical Club (Nov.).—J. B. Ellis, 'New species of N. American Fungi' (*Hendersonia Rauii, H. Viburni, Pestalozzia Jefferisii, P. capitata, Chætomella Stevensonii, Melanconium hyalinum, Septosporium fuliginosum, Coryneum juniperinum, Helicoma velutinum*).—F. L. Scribner, 'North American Genera of Grasses' (arranged in accordance with Mr. Bentham's paper in Journ. Linn. Soc., xix., 14–134, with notes upon certain species).—H. W. Ravenel, 'Note on the Tuckahoe.'

Flora (Nov.).—J. Müller, 'Lichenologische Beitrage' (cont.: new Australian species).—P. G. Strobl, 'Flora der Nebroden' (cont.).

Grevillea (Sept.).—C. B. Plowright, 'Monograph of British *Hypomyces*' (2 plates).—Id., 'Heterœcism of *Uredines*.'—M. C. Cooke, 'New British Fungi' (*Puccinia oxyriæ* Buch. White MSS.; *Stigmatea Nicholsoni* Cooke; spp. nn.).—Id., 'Australian Fungi' (contd.).—Id., 'Fungi of Socotra' (*Stereum retirugum, Trametes Socotrana*, spp. nn.).—C. Kalchbrenner, 'Fungi Macowaniani' (contd.) (South African Fuugi, many new species; *Diorchidium* Kalch., gen. nov.).—M. J. Berkeley, 'Three new Indian Fungi' (*Hygrophorus Hobsoni, Dictyophora nana, Tilmadoche cavipes*). (Dec.) 'British *Hypomyces*' (contd.: *H. Tulasneanus* Plowr., *H. terrestris* Plowr. & Boud., *H. Berkleyanus* Plowr. & Cooke, *H. candicans* Plowr., spp. nn., 2 plates).—'Australian Fungi' (cont.).—'New British Fungi' (cont.: *Agaricus* (*Mycena*) *pullatus* Berk. & Cooke, *A.* (*Inocybe*) *hæmatus* B. & C., *Cercospora Calthæ* Cooke, spp. nn.).—M. C. Cooke, 'Three Asiatic Fungi' (*Diplodia pterocarpi, Hypoxylon cocoinum, Conisphæria Maingayi*, spp. nn.).—Id., '*Cryptosphæria millepunctata* Grev.'

Journal of Linnean Society, xx. 123–124 (Dec. 18).—G. Watt, 'Undescribed and imperfectly known Indian species of *Primula* and *Androsace*' (*P. Gambeliana, P. pulchra, P. vaginata, P. Clarkei, P. filipes, P. Heydei, P. concinna, P. tibetica, P. elongata, P. Kingii, P. Dickieana, P. sapphirina* Hook. f. & Thoms., *P. soldanelloides, P. Wattii* King ms., *P. tenella* King ms., *P. Elwesiana* King ms., *P. reptans* Hook. f., *P. Hookeri, P. muscoides* Hook. f., *P. Stirtoniana, A. geraniifolia, A. Croftii*, spp. nn.), 18 plates.—W. T. T. Dyer, 'Note on origin of *Cassia lignea*' (*Cinnamomum Cassia*, Bl.).

Magyar Nov. Lapok (Nov.).—G. Benkö, '*Vaucheria*-gubacsok.'

Midland Naturalist.—W. B. Grove, 'Fungi of Birmingham' (cont.).—J. Saunders, '*Dicranum montanum* in Bedfordshire.'

Œsterr. Bot. Zeitschrift.—H. Molisch, 'Kalkoxalatkrystalle in der Pflanzenmembran.'—A. Burgerstein, 'Zur Darwin, schen Wurzelkrümmung.'—A. Kerner & V. Borbas, '*Delphinium orientale* Gay.'—D. Hirc, 'Zur Flora von Fiume.'—M. Kronfeld, 'Zur Flora

von Kritzendorf in Niederösterreich.'—B. Stein, 'Culturversuche mit Orobanchen.'—P. Sintenis, 'Cypern und seine Flora' (cont.).

Transactions of Linnean Society.—(Dec.) C. Knight, 'Contributions to the Lichenology of New South Wales.'

Obituary.

Dr. George Dickie was born at Aberdeen November 23rd, 1813, and died there July 7th, 1882. He was educated in that town and graduated at Marischal College A.M., in 1830, and studied medicine during 1832–33, and in Edinburgh in 1833–34; in the latter year he became M.R.C.S. of London. He lectured on Botany at King's College, Aberdeen, from 1839 to 1849, and delivered occasional courses on Materia Medica and Natural History in the same University, receiving from it in 1842 the degree of M.D. He was appointed, in 1849, Professor of Natural History in Belfast, and in 1860 Professor of Botany in Aberdeen, retaining that post until 1877, when the state of his health induced him to resign. His separate works were the 'Flora of Aberdeen' (1830), 'Botanist's Guide to Aberdeen and Banff' (1860), and 'Flora of Ulster' (1864). With Dr. McCosh he wrote 'Typical Forms and Special Ends in Creation.' He was a constant contributor to various journals, our own among the number; his earliest botanical paper, 'On the reproductive organs of *Pilularia*, and the globules of *Chara vulgaris*,' appearing in Jardine's 'Magazine of Zoology and Botany,' in 1837; and latterly, having but few equals in his knowledge of Algæ, he almost restricted his work to that group, his last published paper being one on Algæ from the Himalayas, printed in the 'Journal of the Linnean Society,' xix., 230 (June, 1881). The list of his papers, fifty-four in number, published in the Royal Society's Catalogue, shows that his botanical knowledge had a wide range, embracing the structure and geographical distribution of phanerogams and mosses as well as Algæ. He was elected F.L.S. in 1863, and F.R.S. in 1881.

The death of Richard Parnell, M.D., took place at Edinburgh late in 1882. He devoted himself especially to the studies of Ichthyology and Botany, contributing numerous papers on the former subject to the 'Proceedings of the Royal Society of Edinburgh' (1832–44), in which also appeared (vol. i. pp. 367–9, t. i.), his paper upon a grass which he described and figured as "a new species of the genus *Holcus*"—*H. biaristatus*—a plant which he subsequently ('Grasses of Scotland,' p. 51) reduced to a variety of *H. mollis*, distinguished by having "both [florets] furnished with a long dorsal awn." The work just mentioned is his most important contribution to Botany; it contains figures drawn and engraved by himself, and elaborate descriptions of the species and varieties of Scottish grasses, prefaced by a list, with localities, of those found within fifteen miles of Edinburgh. He appears to have paid

special attention to the *Gramineæ* in various regions, for in his preface he speaks of "possessing an extensive collection of Grasses made by myself, not only throughout this island, but also in the West Indies and the southern parts of North America." In this work he proposes a genus, *Bucetum*, to include *Festuca pratensis*, *F. elatior*, and *Bromus giganteus*, and describes as new certain forms of *Poa*—*P. polynoda*, *P. montana*, and *P. Balfouri*,—the last of which is retained by Babington as distinct, but is placed by Nyman as a subspecies of *P. cæsia*. The 'Grasses of Scotland' was published in 1842; a second part was published in 1845, and the two were then issued in one volume with the title 'The Grasses of Britain.' Professor Babington, who named in his honour *Poa Parnellii* (Eng. Bot. t. 2916), speaks of this work as "an invaluable addition to our knowledge of grasses." In order that no doubt might exist as to the plants considered by him as types of his descriptions, Dr. Parnell deposited with the Linnean Society of London "specimens of the original grass plants employed in the description and figures throughout the entire work." Since that time he does not seem to have taken any active interest in science, and the news of his recent death at Edinburgh surprised most botanists, who had fancied that he had long since passed away.

George Gulliver, F.R.S., who died at Canterbury on the 17th of last November, was born at Banbury on the 4th of June, 1804. In his earlier days he paid some attention to local British Botany: although it was not until 1841 that he published his 'Catalogue of Plants collected in the neighbourhood of Banbury,' the plants themselves (which were then in the possession of the Literary Society of Chatham) were, as he tells us in his preface, collected chiefly between the years 1818 and 1824. The most noteworthy feature in the 'Catalogue' is the large number of Cryptogams enumerated. Mr. Gulliver, in his preface, speaks of having for many years taken "a final leave of botany;" but about 1860 his old love returned, though in an altered form. In the 'Annals of Natural History' for that year he published a paper 'On the marginal nerves of the leaves of Mosses;' and to the same Journal for 1861 he contributed the first of those papers on the crystals called Raphides, in connection with which his name will chiefly be remembered, and to the existence of which bodies he was among the first to call attention. Several papers from his pen appear in the earlier volumes of this Journal, among the most interesting being that in which he pointed out the difference in size between the pollen grains of *Lotus corniculatus* and those of *L. major* (Journ. Bot. 1866, 281–4). About 1868 Mr. Gulliver took up his residence at Canterbury, and became secretary to the East Kent Natural History Society; and it was here that he published (in 1880) his last botanical work, 'Notes of Researches . . . in Botany.'

John Sadler was born on the 3rd of February, 1837, at Gibbleston, Fifeshire. In his early days he was associated with his father in gardening; but in 1854 he was appointed assistant to Dr. Balfour, then professor of botany at Edinburgh, a position of

which he availed himself for increasing his knowledge of the subject. In 1858 he was appointed Secretary to the Botanical Society of Edinburgh, which post he held until his appointment to the office of Curator to the Botanic Garden in 1879. Mr. Sadler devoted a good deal of attention to the study of British Mosses; he published numerous papers upon them, the first of which appeared in the 'Transactions of the Botanical Society of Edinburgh,' in 1863, and made a collection of several hundred specimens, which was acquired for the National Herbarium at the British Museum in 1861. Mr. Sadler assisted Professor Balfour in the preparation of the not very satisfactory 'Flora of Edinburgh,' published in 1863; and published in 1873 a list of the plants of the Isle of May, Firth of Forth (Trans. Bot. Soc. Edin. xi., 390–2). He had a good knowledge of the localities of the rare Scottish plants, and added to the British Flora *Carex frigida* and a Willow described as new by Dr. Boswell Syme, and named by him *Salix Sadleri* (see Journ. Bot. 1875, pp. 33–35, tt. 158, 159). Mr. Sadler died at Edinburgh on December 9th, after a short illness; a portrait of him will be found in the 'Gardeners' Chronicle' for January 18, 1879 (n.s., xi., 81).

Botanical News.

Mr. M. A. Lawson has resigned the Chair of Botany at Oxford, and has accepted the post of Superintendent of the Government Cinchona Plantations, Madras. He leaves England early this month.

British botanists will be glad to know that the twelfth volume of 'English Botany,' ed. 3, is in active preparation. It will contain about six parts, comprising the Ferns and a supplement, with general index, to the whole work. Part i. may be expected early this year.

M. Paul Sintensis, of Bothenhain (Silesia), well known by his exsiccata from Dobrudsha and Cyprus, intends to make botanical collections in the Troad in 1883. M. Sintenis hopes to collect 500–600 species, which he offers to subscribers at £1 a hundred. Half of the sum is to be paid before M. Sintenis leaves for the Levant in February next, the other half on receipt of the plants. Professor Aschersen (Berlin) will name the plants and will give any further information desired.

M. G. Ruhmer, of the Berlin Botanical Museum, is making botanical collections near Benghazi, Cyrenaica, where he hopes to gather 200–300 species. The plants, named by Professor Aschersen, Berlin, will be sold at £1 a hundred. M. Ruhmer left Malta on December 8th.

M. E. Reverchon will undertake an excursion to Crete during the present year, with a view to making botanical collections. He expects to obtain from six to seven hundred species, the price of which to subscribers will be 25f he hundred. His address is: Bollène, Vaucluse, France.

Original Articles.

NEW PASSIFLOREÆ.

By Maxwell T. Masters, M.D., F.R.S.

The following note comprises a description of some previously undescribed *Passifloreæ*, of which specimens are to be found in the herbaria at Kew and in the British Museum (Natural History) at South Kensington. The new genus proposed (*Mitostemma*), together with *Passiflora decipiens*, *P. platystyla*, and *P. ianthina*, are noteworthy not only as additions to the order, but also on morphological grounds and from the point of view of geographical distribution.

Mitostemma Mast., gen. nov. Passifloreærum. — Flores hermaphroditi, 4–5 meri. Floris tubus brevissimus late campanulatus. Sepala oblonga ecorniculata. Petala conformia minora. Corona ad faucem tubi pluriserialis, series extima vel summa e filis ∞ liberis carnosis teretibus acutissimis rubro-aurantiacis, series intermedia e filis præcedentibus consimilibus sed ad latera in alas membranaceas albidas altas superne laceratas extensis, series intima e processubus omnino membranaceis oblongis obtusis lacero-fimbriatis conflata; stamina 8–10 hypogyna, filamenta erecta libera vel plus minus intersese cohærentia, antheræ versatiles oblongæ biloculares. Gynophorum erectum sulcatum enode. Ovarium ellipsoideum sulcato-lobatum 1-loculare, placentis parietalibus 4, styli 4 graciles, stigmata majuscula reniformi-capitata. Ovula anatropa. Fructus et semina ignot.—Frutices v. arbores? Rami teretes. Folia breve petiolata oblonga coriacea glabra 1-costata, nervi secondarii approximati late divergentes ad apices arcuati, venulæ ultimæ numerosissimæ dense intertextæ. Cirri . . . ? Stipulæ . . . ? Flores racemosi. Bracteæ setaceæ.

This hitherto undescribed genus is chiefly remarkable for its peculiar corona, and the hypogynous stamens wholly separate from the gynophore. The corona springs from the mouth of the very short flower-tube, and consists of a large number of separate thread-like thick processes arranged in a triple series; the outermost are terete, acute, fleshy, reddish orange, somewhat shorter than the petals; next to these is a series of lobes like those just described, but each has a membranous lacerate wing on either side, so that the thick fleshy thread is, as it were, a midrib between the two membranous wings; the third and innermost series consists of a number of oblong processes, wholly membranous, crisped, and lacerate at the edges. There is no other corona, except this triple series at the throat of the tube. The 8 or 10 stamens are hypogynous and more or less coherent at the base, surrounding,

but entirely free from, the gynophore. Under ordinary circumstances, in allied genera, the stamens are hypogynous and the ovary sessile in the early stages, but as development goes on the stipes of the ovary lengthens into the gynophore, and the stamens being undetached from it are upraised with it. In the present case they are wholly free from the gynophore. Thus this genus, so far as the arrangement of its stamens goes, presents a condition intermediate between that of *Passiflora multiflora*, in which the stamens are hypogynous and the ovary sessile, and that of most Passifloras wherein the ovary is raised on a long stalk to which the stamens are attached.

M. Glaziovii Mast., sp. n. — Foliis subcoriaceis oblongis acuminatis (16–18 × 4 cm.) basi ad insertionem petioli glandulosis, venulis densissime intertextis; racemis longiusculis (casu foliorum aphyllis); floris (4 cm. diam.) petalis sepala subæquantibus; stylis ovario ovoideo brevioribus.

In Brasiliam meridionalem prope Rio de Janeiro, *Glaziou*, n. 12741 in herb. Kew.

M. Jenmanii Mast., sp. n.—Foliis coriaceis oblongis obtusis (8–9 × 4 cm.) venulis parum remotis; racemis abbreviatis; floris (3 cm. diam.) petalis quam sepala multo brevioribus; stylis elongatis ovario fusiformi longioribus.

In Guiana Britannic. prope flumen Mazaruni, *Jenman*, in herb. Kew., n. 622.

Very like the preceding, but differing from it in the thicker texture of the leaves, looser venation, smaller flowers, longer styles, and narrower ovary. It is a singular circumstance that the only known representatives of an entirely new and distinct genus should have found their way into the herbarium about the same time and from two such widely separated districts as British Guiana and South Brazil respectively. Probably others will hereafter be discovered in the intervening district.

Tacsonia (Eu-Tacsonia) **infundibularis** Mast., sp. n.—Caule glabro angulato; foliis longiuscule petiolatis (petiolo glanduloso) utrinque glabris trisectis, lobis lanceolatis glanduloso-serratis medio longiore; stipulis foliaceis falcato-lanceolatis serratis; pedunculo folio longiore; bracteis magnis (4–5 cm.) lanceolatis serratis; floris tubo 11 cm. long. glabro basi dilatato, infra medium cylindrato supra medium ampliato, fauce parum constricto; sepalis tubo brevioribus oblongis subapice aristulatis; corona fauciali inexplicata, corona membranacea alta deflexa; cæt. non visa.

Venezuela, *Funck & Schlim*, n. 1381, in herb. Mus. Brit.

The foliage is like that of *T. adulterina*, and suggestive of its being a variety with lobed leaves; but there are ample marks of distinction in the angular stem, the leafy stipules, the glandular leaf-stalk, the long flower-stalk, and the absence of faucial corona.

Passiflora (Astrophea) **deficiens**, sp. n.—Caule tereti cirrato; foliis glabris membranaceis oblongis breviter acuminatis; petiolis 3 cm. apice biglandulosis; floribus 3 cm. long. diam. 5–6 c.m.; floris tubo brevi glabro campanulato; sepalis oblongis obtusis

ecorniculatis tubum 4–5-plo superantibus ; petalis conformibus minoribus ; corona fauciali filamentosa, filis summis petalis parum brevioribus petaloideis a latere compressis falcato-ligulatis apice longe productis, filis internis perplurimis multo brevioribus capillaceis capitellatis asperulis, corona media membranacea carente, corona basilari profunde tubulata membranacea superne lacinulata gynophorum fere ad medium cingente ; ovario oblongo sulcato, stylis subulatis puberulis.

In Guiana Britanic. prope flumen Essequibo, *Jenman*, in herb. Kew., n. 1169.

A very interesting species, intermediate in some respects between the subgenera *Astrophea* and *Granadilla*. Thus, while the habit, the form of the flower, the faucial corona, and the gynophore with a central node or dilatation, are those of § *Astrophea*, the deep tubular basilar corona encircling the gynophore is like that of § *Granadilla*. The median or membranous corona is entirely absent, a very rare circumstance.

P. (Astrophea) **platystyla** Mast., sp. n. — Ramis cirratis teretibus pubescentibus ; foliis oblongis obtusis coriaceis deorsum flavo- tomentosis, petiolis brevibus superne glandulosis ; pedunculis petiolos duplo superantibus ; alabastris clavato-oblongis ; floris 3–4 cm. (diam.) tubo brevi campanulato puberulo ; sepalis oblongis obtusis ecorniculatis setoso-puberulis ; petalis conformibus minoribus ; coronæ faucialis filamentosæ pluriserialis, filis extimis petaloideis dolabriformibus petalis parum brevioribus, filis intimis multo brevioribus complanatis apice malleiformibus ; tubo intus infra faucem crassiusculo tuberculato ; corona membranacea e tubo infra medium assurgente margine in lobulos filiformes diviso ; gynandrophoro glabro supra medium nodoso ; ovario sessile setoso pubescente, stylis complanatis setosis.

In Brasilia meridionali, prope Rio de Janeiro, *Glaziou*, in herb. Kew., n. 13454.

It is remarkable that so distinct a species should not before have been recorded from so well-worked a district. The head-quarters of the subgenus *Astrophea* are in the extreme north-western corner of South America, but a few are found in Brazil, among them *P. hæmatostigma*. This last-named species is nearly allied to the present one, which, however, has larger flowers, with a more funnel-shaped tube, warted in the interior, ecorniculate sepals, glabrous gynandrophore, and flat styles.

P. (Plectostemma, Eudecaloba) **Pavonis** Mast., sp. n.—Ramis gracilibus subangulatis demum glabratis ; petiolis filiformibus 1 cm. long. eglandulosis ; stipulis deciduis minimis falcato-subulatis ; foliis glabris membranaceis parvis (15 mm. long. 20 mm. lat.), eglandulosis palmatim 5-nerviis antice breviter 3-lobis, lobis oblongis obtusis, medio latiore ; pedunculo petiolum superante ; bracteis minimis caducis ; floribus 2 cm. diam. late campanulatis, tubo setuloso basi intruso ; sepalis e basi lata lanceolatis 3-nerviis ; petalis brevioribus, ? flavidis ; corona fauciali filamentosa, filis 1-seriatis petalis dimidio brevioribus flavidis basi violascentibus,

corona membranacea fauciali inflexa fimbrillifera, corona submediana brevi annulari; filamentis longis; ovario ovoideo setuloso; stylis deflexis ovario longioribus.

Mexico ("Nouvelle Espagne"), *Ruiz & Pavon*, in herb. Mus. Brit.

Resembles *P. mexicana* Juss., but that species has bilobed ocellate leaves and apetalous flowers.

P. (Plectostemma, Decaloba) **Kalbreyeri** Mast., sp. n.—Ramis teretibus pubescentibus; foliis (5–7 cm.) carnosulis desuper rugosis, deorsum pubescentibus setosis ovatis 3-nerviis basi in petiolum brevem sensim angustatis apice truncatis; stipulis lineari-setaceis; pedunculis binis 3–4 cm. longis petiolos superantibus gracilibus apicem versus bracteis parvis membranaceis lanceolatis serrulatis munitis; floris (4 cm. diam.) tubo late campanulato basi intruso; sepalis tubo 2–3-plo longioribus oblongis obtusis setoso-puberulis rubro-aurantiacis; petalis flavidis sepalis dimidio brevioribus; coronæ faucialis filis extimis petala æquantibus flavidis versus medium cæruleo-fasciatis, filis intimis parum minoribus flavidis, corona media inflexo plicata, corona infra mediana brevi carnosula annuliformi; gynandropho glabro gracili; filamentis gynandrophorum longioribus; ovario globoso dense setoso, stylis glabris subulatis ovario longiore.

Nov. Granata, Prov. Ocàna, *Kalbreyer*, 1253, in herb. Kew.

A species remarkable among its allies for its relatively large bracts, slender gynophore, and unusually long filaments and gynophore.

P. (Murucuia) **ianthina** Mast., sp. n.—Foliis glabris palmatim 3-lobis, lobis oblongis obtusis, medio parum longiore. ad basin glanduloso-serrulato; pedunculo petiolum duplo superante; floris violacei tubo 4 cm. long., cylindrato basi ventricoso; sepalis 4 cm. longis oblongis carinatis, carina dorso subapice in corniculum foliaceum producta; petalis conformibus minoribus; corona fauciali pluriseriali filamentosa, filis summis petalis 3–4-plo brevioribus, cæteris sensim minoribus e tubi parte superiore tertia emergentibus, corona membranacea erecta integra; filamentis basi haud separatis; ovario ovoideo glabro, stylo brevi dilatato in ramos 3 mox diviso.

Bolivia, *Bridges*, in herb. Mus. Brit.

This is a remarkable species, belonging to that section of the subgenus *Murucuia* in which the membranous corona emerges from near the base of the tube. In the form of the flower it is much like a true *Tacsonia*, but the filamentous faucial corona, occupying the upper third of the flower-tube, and the membranous corona springing upwards from the tube just above the dilated partion, serve to indicate its relations to the *Murucuia* group.

ON THE FLORA OF THE UPPER TAMAR AND NEIGHBOURING DISTRICTS.

By the Rev. W. Moyle Rogers, F.L.S.

(Continued from p. 20).

Prunus insititia L.—III. Bridgerule, in some quantity. IV. About Okehampton.

P. domestica L.—I. Lane between Poughill and Bude, rather frequent. Elsewhere near Bude, near Marhamchurch, and between Marhamchurch and Widmouth. Unusually frequent, and in some instances well away from houses and gardens.

P. avium L.—I. Between Stibb and Poughill. Between Marhamchurch and Bridgerule. III. Bridgerule. Pyworthy.

P. Cerasus L.—Rather common in most of the lanes,

Agrimonia odorata Mill.—Near Curry Lane, two or three plants together. III. Bridgerule, in several spots.

Poterium Sanguisorba L.—I. Cliffs at Sandymouth.

Potentilla procumbens Sibth.—I. About Bude. Between Stratton and Launcells. II. St. Stephen's. III. Bridgerule and neighbourhood, rather common. Between Lifton and Bridestowe.

Comarum palustre L.—II. Between canal and river, about two miles south of Bridgerule Bridge. III. Tamar Valley: by Bridgerule Mill (north of Bridge); in Scotland Bog; and in Upper Bridgerule Bog. New record for N. Devon, and very rare in S.W. England generally. The discovery of this species in fairly good quantity on both banks of the Upper Tamar is especially interesting, as it is believed by Mr. Briggs to be extinct now in the station ("near the Weir Head," within the area of the Plymouth Flora) given for it in Banks' Flora, 1830.

Rubus Idæus L.—II. In thickets by canal above Bridgerule. III. Between Lifton and Bridestowe. IV. Near Okehampton, common.

R. fissus Lindl. III. Bridge Moor, and in like situations in Bridgerule and Pyworthy, in great quantity. Near Dunsland Cross. New record.

R. plicatus W. & N.— [? III. Bridgerule Bog, needs further study.] IV. Okehampton, among bracken by the river, in good quantity. New record.

R. affinis W. & N.—I. Tackbear. Week St. Mary. III. Frequent on commons and in open moorland places between the river and Holsworthy. Near Bridestowe. IV. About Okehampton, common.

R. Lindleianus Lees.—II. By canal at Bridgerule, rather frequent. III. Bridgerule Bog. Bridgerule and Holsworthy Road. Tinney Moor. Between Lifton and Bridestowe. IV. Near Okehampton. Typical *Lindleianus* seems much less common in N. Devon than in S. Devon; but the bramble alluded to in Fl. Plym. (p. 112) as allied to it is exceedingly common on both sides of the Upper Tamar, and along the N. Cornwall coast. It appears to be distributed throughout Devon, and usually in abundance.

R. rhammifolius W. & N.—III. Bridgerule. IV. Okehampton.

R. imbricatus Hort.—II. Bridgerule, near the village in two of the lanes, but in very small quantity. This bramble, so common in the lower part of the Teign Basin, I have not yet met with in N. Devon.

R. discolor W. & N.—In all the districts, but often quite sparingly.

R. leucostachys Sm. I. About Tackbear. III. Bridgerule. Holsworthy. Near Dunsland Cross. IV. Okehampton. Only locally common.

R. hirtifolius Müll.—III. Between Pyworthy and the road from Bridgerule to N. Tamerton. Near Dunsland Cross railway-station. In both places differing slightly from the Plymouth plant. New record.

R. Salteri Bab., b. *calvatus*. IV. About Okehampton. New record.

R. villicaulis W. & N.—I. Near Bude. Jacobstow. St. Knighton's Kieve. III. Bridgerule and neighbourhood, common. IV. Okehampton. b. *adscitus*. — I. Near Marhamchurch. Jacobstow. Pentargan Bay. Near St. Knighton's Kieve. II. Whitstone. III. Bridgerule and Tinney, common. Between Lifton and Bridestowe. Near Dunsland Cross.

R. macrophyllus Weihe, a. *umbrosus*.—Very common. b. *macrophyllus*. — I. Lane east of Stratton, in considerable quantity. II. Near Bridgerule, towards Launcells. III. Bridgerule. Apparently rather frequent.

R. Hystrix Weihe. — II. Wood-border, roadside near St. Stephen's. IV. Near Okehampton. Not typical, but just the same plant in both places.

R. Radula Weihe. — III. Bridgerule, in several spots, but not common. IV. Okehampton, fairly frequent.

R. diversifolius Lindl. — I. North-east end of Summerleaze Down, in good quantity. Near Burrow. III. Bridgerule, locally abundant. but not the typical plant. Near Dunsland Cross.

R. pyramidalis Bab. — III. Wood between Tetcott and North Tamerton.

R. glandulosus Bell. — I. Between Stratton and Launcells, common. St. Knighton's Kieve. III. Near Dunsland Cross. IV. Okehampton, common.

R. Balfourainus Blox. — III. Near Dunsland Cross Railway Station.

R. corylifolius Sm.—Locally common in I. II. and III. Usually a. *sublustris*.

R. cæsius L.—I. Near Bude. Boscastle.*

Rosa spinosissima L. — I. Cliffs above Sandymouth, in good quantity. Summerleaze Down, south-east end.

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* I may mention here that a small collection of *Rubi*, gathered by Mr. Waterfall in the neighbourhood of Okehampton and sent fresh to Mr. Briggs, contains (in addition to some of those recorded for the same neighbourhood above) ? *thyrsoideus*, *adscitus* (North Tawton), ? *hirtifolius*, *mucronulatus*, and the var. of *Borreri* for which Mr. Briggs (Fl. Plym.) has suggested the name *dentatifolius*.

R. tomentosa Sm.—Fairly common in I. II. and III.; a frequent form being one with very dark flowers and large grey clothy leaves. But I have met with moderately good *scabriuscula* in one place near Stratton, and with *sylvestris* near Marhamchurch.

R. micrantha Sm.—Frequent in I. II. and III.

R. canina L.—a. *lutetiana* and e. *dumalis*, common, especially the latter.—f. *biserrata*. I. Between Bude and Poughill, in two or three places. III. Bridgerule, in a field near Furze Farm. IV. Near Okehampton.—g. *urbica*. I. Near Widmouth. II. and III. Bridgerule, not very common.—h. *frondosa*. II. Bridgerule, by canal, in considerable quantity. Whitstone, between the school and church. III. Bridgerule, in same field with *biserrata*. —Var. *obtusifolia*. Rather common in II. and III.—i. *arvatica*. I. Lane near Bude, several bushes. Roadside near Marhamchurch.

R. leucochroa Desv.—Rather common in I. II. and III.

R. stylosa Desv., a. *systyla*.—Only moderately frequent in I. II. and III.

R. arvensis Huds.—Common, but very much less so than in S. Devon.—b. *bibracteata*. II. Bridgerule, scarce.

Pyrus torminalis Ehrh.—II. Between Bridgerule and Whitstone, in one place in roadside hedge.

P. latifolia Syme.—I. Near Marhamchurch, in two stations rather more than a mile apart, on bushy hedgebanks. Apparently native.

P. Malus L.—Frequent in I. II. and III.; a. *acerba* being apparently the more abundant form, about Bridgerule at all events.

Lythrum Salicaria L.—I. II. and III. Exceedingly common.

Peplis Portula L.—Common.

Epilobium tetragonum L.—I. II. and III. Fairly common, especially near the sea; but less so than *E. obscurum* Schreb. and *E. palustre* L. The exceeding abundance of *palustre* as a roadside plant is most remarkable. A plant which is clearly a hybrid between *palustre* and *parviflorum* occurs in ditches between Bridgerule West and Whitstone (II.), and in Bridgerule East (III.)

Callitriche hamulata Kütz., b. *pedunculata*.—III. Ditches, Bridgerule.

Sedum Telephium L., a. *purpurascens*.—I. On both sides of a lane, between St. Knighton's Kieve and Trevalga, for a considerable distance. So well established as to assume the look of a native. II. Near Whitstone, roadside not far from cottage.

S. anglicum Huds.—I. Coast, common. IV. Okehampton; Belstone Cleave.

Cotyledon Umbilicus L.—Generally distributed.

Chrysosplenium oppositifolium L.—I. St. Knighton's Kieve. III. Holsworthy Road, Bridgerule. IV. Belstone Cleave.

Eryngium maritimum L.—I. Widmouth.

Petroselinum segetum Koch.—Between Bude and Stratton.

Sison Amomum L.—I. Rather common about Bude, Stratton, and Marhamchurch.

Carum verticillatum Koch.—I. About Tackbear, and between it and Widmouth. II. Between canal and river north and south of

Bridgerule, common. Wilsworthy Moor. III. Bridgerule, Pyworthy, and Tinney; in great quantity in nearly all the marshy land. New record for N. Devon.

Torilis nodosa Gaert.—I. Near Sandymouth, Poughill, Bude, and Marhamchurch. Stratton and Launcells Road, occasionally. II. Bridgerule, at Littlebridge. Rare, except near the sea, and only in very dry warm spots.

Conium maculatum L. — I. Marhamchurch. III. Bridgerule. IV. Okehampton. Local.

Smyrnium Olusatrum L.—I. Bude; Marhamchurch; Burrow.

Viburnum Opulus L. — Generally though somewhat sparsely distributed.

Rubia peregrina L.—I. Near Bude and Widmouth, common.

Galium verum L.—I. Sandymouth and Bude. This, like the last, I have as yet seen only by the coast.

G. Mollugo L.—I. Between Stratton and north-west boundary of Bridgerule, here and there in considerable quantity, but remarkably local. Also near Marhamchurch (Hind) and Week St. Mary; but apparently altogether absent from very large portions of the district. II. In two places near Bridgerule. On Launceston Road, south of Whitstone, occasionally; becoming very common near Launceston. III. Lifton and Okehampton Road, common; but, higher up the river, from Bridgerule to Holsworthy, over many miles of country, I have not been able to find a plant. IV. About Okehampton, common. I cannot suggest any reason for so very local a distribution of this usually very common West of England species.

G. sylvestre Poll.—I. Under this, Prof. Babington thinks, must come a remarkable-looking plant which I found in small quantity among furze-bushes on Efford Down, near Bude. It was the only white-flowered *Galium* in the immediate neighbourhood. I believe not hitherto recorded from the Peninsula.

G. palustre L. — Common everywhere, the variety *elongatum* being the prevailing form.

G. uliginosum L.—III. Bridge Moor and Bridgerule Bog. New record.

Valerianella Auricula DC.—III. Bridgerule, in two rather widely separated corn-fields. New record.

Carduus nutans L.—I. Poughill; Bude. III. Near Bridestowe. Apparently quite local.

C. pratensis Huds. — II. Between canal and river, south of Bridgerule. Not in 'Top. Bot.' for E. Cornwall, but recorded from Week St. Mary by Dr. Hind. It has, I believe, no other Cornish stations on record. III. Bridgerule, Tinney, and Pyworthy, in several places, in great quantity. Between Dunsland Cross and Ashbury stations, on both sides of the railroad. Locally most abundant. Queried for N. Devon in 'Top. Bot.'

Arctium majus Schkuhr.—I. Bude, on waste ground by lifeboat-house, two or three plants, with more of *A. minus*. Waste ground at Burrow.

A. minus Schkuhr.—Rather common.

A. intermedium Lange.—I. With *A. majus* at Burrow. IV. About Okehampton. If I understand it rightly, this is not uncommon.

Serratula tinctoria L.—I. II. and III. Rather common, but with local tendencies.

Centaurea nigra L.—Common; usually b. *decipiens*, radiate and irradiate, the irradiate forms being far more frequent than in S. Devon, and coming earlier into flower than the radiate.

C. Scabiosa L.—I. Sandymouth, Bude, &c. II. Bridgerule. Apparently quite rare away from the immediate neighbourhood of the sea.

Chrysanthemum segetum L.—I. Near Boscastle (Hind) and Tintagel. Locally very abundant.

Matricaria Parthenium L.—I. Boscastle. III. Bridgerule. Denizen everywhere.

Tanacetum vulgare L.—I. Near Stratton. Whitstone Churchyard and lane. Jacobstow. Boscastle, and between it and Tintagel, occasionally. III. Pyworthy, in two or three places between the village and Dux Common. Rare; and with much more doubtful claims as a native than in the Teign Valley.

Anthemis Cotula L.—Rather common.

A. nobilis L.—I. Between Stratton and Launcells. Week St. Mary and Jacobstow, frequent. Valley between St. Knighton's Kieve and the sea, in great quantity. II. By canal north of Bridgerule, and at Littlebridge. Between Whitstone and Launceston. rather frequent. III. Between Bridgerule mill-stream and the river.

Achillea Ptarmica L.—Remarkably common.

Artemisia Absinthium L.—I. Between Stibb and Sandymouth, near a farmhouse. On the cliffs at Pentargan Bay, and in great quantity about Boscastle.

Filago germanica L.—I. Boscastle. II. Bridgerule. III. Bridgerule. Between Lifton and Bridestowe. IV. Okehampton. Rather uncommon.

Gnaphalium uliginosum L.—I. Week St. Mary. II. Whitstone; St. Stephen's. III. Bridgerule. IV. Belstone.

Senecio sylvaticus L.—I. Widmouth; Pentargan Bay. II. St. Stephen's. III. Church Hill, Bridgerule. IV. Okehampton.

S. erucifolius L.—I. Sandymouth, Bude, and Widmouth, abundant. Stratton; Launcells. II. By canal at Bridgerule. III. Lifton and towards Lew Down, common. Very local except on the seaboard.

Bidens tripartita L.—I. Wainhouse Corner. II. Bridgerule:—between Littlebridge and the canal, and in roadside ditch to the south of the village. III. By Darrell's Cross, Pyworthy. Near Holsworthy, on the Bude Road.

Inula crithmoides L.—I. Cliffs at Boscastle.

Petasites vulgaris Desf.—I. In Langford Plantation, Marhamchurch.

Cichorium Intybus L.—I. Abundant about Bude, especially towards Marhamchurch and Stratton. Between Stratton and Launcells. II. Littlebridge, Bridgerule; only a plant or two. III. Bridgerule, one plant not far from the church.

Leontodon hirtus L.—Generally distributed, and very common.

L. hispidus L.—II. Hill between Werrington and St. Stephen's, very abundant. III. Bridgerule, roadside-bank near vicarage, one plant. Between Lifton and Okehampton, rather frequent. IV. Common about Okehampton.

Helminthia echioides Gaert. — I. Sea-coast from Sandymouth to Widmouth, frequent. Between Stratton and Launcells. Near Marhamchurch. III. Between Bridgerule Church and Bridge Moor, a few plants.

Crepis taraxacifolia Thuill. — I. Near Bude, in some quantity. III. Bridgerule, near a farm, two or three plants. Colonist.

C. biennis L. — I. Near Stratton, one plant in hedgebank. Colonist.

Hieracium aurantiacum L.—I. Whitstone Churchyard. Denizen well established and abundant.

H. umbellatum L. — I. II. and III. Quite common. IV. Okehampton ; Belstone. The only native *Hieracium* yet seen.

(To be continued.)

A SYNOPSIS OF THE GENUS *SELAGINELLA*.

By J. G. Baker, F.R.S., &c.

(Continued from p. 5.)

Subgenus I.—Selaginella proper.

1. S. spinosa P. B. Æthog., 112; *S. spinulosa* A. Br.; *S. selaginoides* Link.; *Lycopodium selaginoides* Linn.; Schk. Krypt. t. 165; Hook. Brit. Ferns, t. 52; Eng. Bot. t. 1148; *L. ciliatum* Lam.—Barren stems short, trailing, slender, little branched, with short ascending branches. Leaves lax and spreading on the lower part of the barren branches, dense and ascending upwards, lanceolate, $\frac{1}{2}$–1 lin. long, acute, bright green, ciliated, thin but moderately firm in texture; midrib obscure. Fertile stems erect, simple, 2–3 in. long, with a leafy peduncle about as long as the spike. Spike multifarious; bracts lax, ascending, lanceolate or ovate-lanceolate, $\frac{1}{8}$–$\frac{1}{6}$ in. long, similar to the leaves in texture, strongly ciliated, not acutely keeled.

Hab. Arctic and temperate zones of Europe and North America, in damp places.

2. S. deflexa Bracken. Fil. Amer. Expl. Expedit. 332, t. 45.—Stems tufted, flexuose, ascending, stramineous, 3–4 in. long, simple or little branched. Leaves multifarious, crowded, uniform, ovate or ovate-lanceolate, under a line long, acute, strongly reflexed, thin but firm in texture, conspicuously bristle-ciliated. Spikes 1–1$\frac{1}{2}$ in. long, $\frac{1}{6}$ in. diam., sessile; bracts similar to the leaves in shape, texture and ciliation, but larger, the lower patent, the upper ascending.

Hab. Sandwich Islands, *Dr. Hildebrand!*

3. S. Preissiana Spring Mon. ii. 61; *Lycopodium gracillimum* Kunze Farnn. tab. 100, fig. 2; *L. musciforme* F. M.—Stems tufted, very slender, square, stramineous, erect, 1–2 in. long including the spike, usually simple. Leaves uniform, lax, spreading, decussate, lanceolate, about ½ lin. long, not ciliated, thin but moderately firm in texture, acute, with a distinct midrib. Spikes ½ lin. diam., reaching down nearly to the base of the stems; bracts ovate or ovate-lanceolate, ascending, imbricated, acutely keeled.

Hab. West Australia, Victoria, and Tasmania, in damp ground.

4. S. uliginosa Spring. Monog. ii. 60; *Lycopodium uliginosum* Labill. Pl. Nov. Holl. ii. 154, t. 251.—Stems densely tufted, slender, pale, square, 3–12 in. long, with several ascending laxly pinnately arranged simple or forked branches in the upper half. Leaves lax, decussate, ovate or ovate-lanceolate, ½–1 lin. long, acute, thin but firm in texture, spreading or rather ascending, entire. Spikes copious, sessile at the end of the branches, ½–1 in. long, 1½–2 lin. diam.; bracts ovate or ovate-lanceolate, much imbricated, similar to the leaves in texture, acutely keeled.

Hab. East Australia, frequent from Queensland to Victoria and Tasmania, in swamps.

5. S. pumila Spring Mon. ii. 60; *Lycopodium pumilum* Schlecht. Adumb. 6, t. 3; *L. pygmæum* Kaulf.; Kunze Farnn. t. 100, fig. 1; *L. bryoides* Kaulf.—Stems tufted, very slender, stramineous, erect or decumbent, if the former not more than 2–3 in. long, simple or distantly pinnate, with short simple ascending branches. Leaves very lax, spreading, ovate or lanceolate, acute, ¼–1 lin. long, pale green, very thin and membranous in texture, not ciliated. Spikes terminal, ¼–½ in. long, 1-12th to 1-8th in. diam.; bracts deltoid, acute, imbricated, erecto-patent, ½ lin. long, convex on the back, but not acutely keeled.

Hab. Cape Colony, in shady and damp places. *L. pygmæum* Kaulf. is a form with short tufted erect stems and smaller narrower leaves; *L. bryoides* Kaulf. a form with longer trailing stems and broader larger less acute leaves.

6. S. rupestris Spring in Fl. Bras. i. 118; *Lycopodium rupestre* Linn.; Schk. Krypt. t. 165; Raddi Fil. Bras. t. 4 bis, fig. 2; *L. bryopteris* Wall., non Linn.; *L. Dregei* Presl.—Dill. Musc. t. 63, fig. 11.—Stems densely tufted, decumbent or ascending, reaching ½–1 ft. long, with distant pinnately arranged simple or slightly compound branches. Leaves dense, multifarious, uniform, ascending, densely imbricated, linear or linear-lanceolate, ½–1 lin. long, with a distinct transparent awn, pale green, convex and sulcate on the back, rigid in texture, strongly ciliated. Spikes square, sessile, ½–1 in. long, ½ lin. diam.; bracts rigid, ovate-lanceolate, acute, much imbricated, acutely keeled.

Hab. North and south temperate zone of both the Old and New Worlds; also on the Andes, Himalayas, and mountains of Brazil and Ceylon. The most widely spread species of the genus, but not known in Europe. Milde Fil. Eur. 262, defines ten varieties. *S. iortipila* A. Br., from the mountains of South

Carolina, is a dwarf form with leaves more gibbous on the back, short cilia, and a sudden denticulate awn. *L. struthioloides* Nutt., from California, has also very thick short leaves and a sudden awn, combined with a suberect habit and more compound branches than usual. *L. bryoides* Nutt. is a very dwarf form with decumbent main stems, with short close stout ascending leafy branches.

7. S. OREGANA Eaton in S. Wats. Bot. Calif. 350. — Stems pendent, flaccid, 1–6 feet long, pinnate, much branched. Leaves uniform, linear-lanceolate, green, convex and grooved on the back, sparsely denticulate, scarcely a line long, acute but not bristle-tipped. Spikes square, very slender, resembling the sterile branchlets.

Hab. Oregon, hanging from branches, in moist forests, in dense masses. Discovered by General Kautz in 1855.

8. S. SANGUINOLENTA Spring Mon. ii. 57; *Lycopodium sanguinolentum* Linn. Sp. 1567; Amoen. Acad. ii. 363, tab. 4, fig. 26.— —Stems densely matted, often forked at the base, very slender, bright red, spreading or ascending, reaching ½ ft. or more in length, copiously pinnately branched, the branches short, ascending and again compound. Leaves decussate, oblong, obtuse, with a minute cusp, ¼ lin. long, ascending, thick in texture and convex on the back, pale green. Spikes ½–1 in. long, ½ lin. diam., square; bracts thick, deltoid, acute, ¼ lin. long, much imbricated, acutely keeled.

Hab. Eastern Siberia, in rocky mountainous situations, and discovered lately by Dr. Aitchison in the Kurram Valley, in Afghanistan.

Subgenus II.—STACHYGYNANDRIUM.

Series I.—DECUMBENTES.

Group 1.—MICROPHYLLÆ.

9. S. CÆSPITOSA Spring Mon. ii. 90; *Lycopodium cæspitosum* Blume. — Stems very slender, trailing, matted, 2–3 in. long, pinnately branched, the branches slightly compound. *Leaves of the lower plane close, suborbicular, obtuse, ½ lin. long, firm and rigid in texture, pale green, entire, subdecurrent on the upper side at the base, flat, with a distinct midrib; those of the upper plane much smaller, obovate, obtuse. Spikes unknown.

Hab. Mountains of Java. Most like *S. rotundifolia*, but the leaves are crowded and firmer in texture.

10. **S. Mariesii** Baker, n. sp. — Stems densely matted, very slender, trailing, 2–3 in. long, green or bright red, distantly pinnately branched, the branches slightly compound. Leaves of the lower plane spreading, spaced except the uppermost, oblique-oblong, ½ lin. long, obscurely pointed at the lower corner,

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* The descriptions of the leaves of the dimorphous species must be understood, unless it is otherwise expressly stated, to refer to those of the middle and lower part of the branches; not to those of the main stem, which, especially in the decompound species, often differ widely from those of the branches in shape and direction.

moderately firm in texture, flat, with an obscure midrib, the upper side cordate and ciliated at the base, where it is imbricated over the stem, the lower rounded; leaves of upper plane half as long, oblique-ovate, subacute, ascending. Spikes short, square, ½ lin. diam.; bracts ovate, acute, much imbricated, strongly keeled.

Hab. Japan, in mountain woods, *Maries!* Midway between *denticulata* and *delicatissima*.

11. S. VAGINATA Spring, Mon. ii. 87. — Stems densely matted, pale, trailing, 2–3 in. long, with distant erecto-patent slightly compound branches. Leaves of the lower plane close, erecto-patent, oblique ovate-lanceolate, acute, ½ lin. long, much incurved, firm in texture, ciliate-denticulate on all the edge, cordate and more conspicuously ciliated on the upper side at the base, where it is much imbricated over the rachis, a little rounded on the lower side; midrib obscure; leaves of the upper plane half as long, ascending, imbricated, ovate-cuspidate. Spikes copious, sessile, square, ⅙–¼ in. long, ¾ lin. diam.; bracts ovate-lanceolate, strongly keeled.

Hab. Bootan and Khasia Mountains, *Griffith!* Moulmein, *Parish* 148! Neilgherries, *Perottet!* *L. ciliare* Tayl. MSS. is a form with laxer more spreading leaves and longer cilia.

12. S. DENTICULATA Link, Fil. Berol. 159; *Lycopodium denticulatum* Linn. Sp. 1569—Dill. Musc. t. 66, fig. 1 A. — Stems densely matted, pale, trailing, reaching a length of ½ ft., copiously pinnately branched, the lower branches copiously flabellately compound. Leaves of lower plane close or slightly spaced, broad ovate, oblique, subacute, ¾–1 in. long, spreading or erecto-patent, moderately firm in texture, flat, denticulate, cordate on the upper side at the base, much imbricated over the stem, rounded on the lower; leaves of upper plane half as long, oblique ovate, cuspidate, rather diverging. Spikes sessile, square, about ½ in. long, ½ lin. diam.; bracts ovate, acute, much imbricated, strongly keeled.

Hab. Mediterranean region from Madeira and the Canaries to Syria. The Cape plant included here by Spring is a distinct species. *S. Kraussiana*, often called *denticulata* in gardens, is totally different. We have a specimen from the island of Elba with a distinctly platystichoid spike. The whole plant, in exposed places, sometimes turns bright red when old.

13. S. MONGHOLICA Ruprecht, Beitr. iii. 32. — Stems very slender, wiry, trailing, reaching a length of ½–1 ft., copiously pinnately branched, the short branches copiously flabellately compound. Leaves of the lower plane crowded or rather spaced, erecto-patent, oblong, oblique, ½ lin. long, firm in texture, broadly rounded and ciliated on the upper side at the base, where it is imbricated over the stem; midrib distinct; leaves of the upper plane half as long, ascending, oblique oblong. Spikes sessile, ¼–⅓ in. long, ¾ lin. diam., square; bracts deltoid, acute, crowded, with a raised keel.

Hab. North China; first gathered by Sir G. Staunton between Pekin and Jehol. A near ally of *S. denticulata*. Var. *Rossii* Baker, from the province of Sching-king, differs by its spaced strongly

deflexed leaves with revolute margins and bright crimson old stems. In exposed places the larger leaves are often wrapped round the branches, as in *vaginata*.

14. S. HELVETICA Link Fil. Hort. Berol. 159; *Lycopodium helveticum* Linn. Sp. 1568; Schk. Krypt. t. 165; Jacq. Austr. t. 196; *L. radicans* Schrank. — Stems densely matted, slender, pale, trailing, 2–3 in. long, forked at the base, distantly pinnately branched, with short erecto-patent slightly compound branches. Leaves of the lower plane spreading, close or slightly spaced, oblong or ovate-oblong, $\frac{1}{2}$–$\frac{3}{4}$ lin. long, obtuse or subacute, oblique, produced on the upper side, rounded on both sides at base, obscurely ciliated, flat, pale green, moderately firm in texture; leaves of the upper plane oblique ovate, acute, $\frac{1}{2}$ as long, rather divergent. Spikes distinctly peduncled, $\frac{1}{2}$–1 in. long, 1 lin. diam., terete; bracts ovate, acute, imbricated, $\frac{1}{2}$ lin. long, thin but firm, not acutely keeled.

Hab. Central Europe, and through Siberia to Persia, North China, and Japan.

15. S. AGGESTA Spring Mon. ii. 89. — Stems slender, trailing, densely matted, about an inch long, 2–3 times dichotomously forked. Leaves of lower plane spaced, except at the tip of the branches, oblique ovate-lanceolate, obtuse or subacute, $\frac{1}{2}$ lin. long, spreading, revolute, dark green, moderately firm in texture, broadly rounded on the upper side at the base, not ciliated; leaves of lower plane $\frac{1}{3}$ as long, ovate, acute, ascending, imbricated, distinctly keeled. Spikes unknown.

Hab. Khasia Mountains, on rocks, *Griffith!*

16. S. ORNITHOPODIOIDES Spring Mon. ii. 93; *Lycopodium ornithopodioides* Linn. Sp. 1569, as regards the figure of Dillenius cited, Hist. Musc. t. 66, fig. 1 B, but not the Ceylon plant; *L. hispidum* Willd.—Stems slender, pale, trailing, densely matted, 2–3 in. long, copiously pinnately branched, with short erecto-patent flabellately compound branches. Leaves of the lower plane close, oblique ovate-lanceolate, about a line long, spreading, flat, acute, moderately firm in texture, the midrib distinct in the upper part, the base broadly rounded and distinctly ciliated on the upper side, less rounded and not ciliated on the lower; leaves of the upper plane $\frac{1}{3}$ as long, oblique ovate, acute, ascending, imbricated. Spikes short, square, $\frac{1}{2}$ lin. diam.; bracts ovate, acute, much imbricated, strongly keeled.

Hab. Khasia Mountains, *Hook. fil. & Thomson!* A near ally of *S. plumosa*, well represented in the figure of Dillenius above cited.

(To be continued.)

ON THE FLORA OF INNISHOWEN, CO. DONEGAL.

By H. C. Hart, B.A.

(Concluded from p. 26.)

Let us now consider the Flora of Innishowen with regard to the different groups of species of which it is composed, as separated by Watson into "Types." The Highland or Alpine type is well represented, about half the total number of Irish species being found in Innishowen.

Highland Type.

Draba incana.
Silene acaulis.
Sedum Rhodiola.
Saxifraga oppositifolia.
? S. stellaris.
Hieracium anglicum.
H. crocatum.
Saussurea alpina.
Arctostaphylos Uva-ursi.
Vaccinium Vitis-Idæa.
Polygonum viviparum.
Salix herbacea.
Juniperus nana.
Carex rigida.
Isoetes lacustris.
Lycopodium alpinum.
L. selaginoides.

Of the above, those in italics alone maintain a Highland character in Innishowen, and of these *Vaccinium*, *Silene*, and *Salix* occur below 1000 feet. The low vertical range of some alpine species in Ireland is very noteworthy, that of *Salix herbacea* especially so. The following belong to the

Northern Type.

Drosera anglica.
Parnassia palustris.
Sagina subulata.
Prunus Padus.
Rubus saxatilis.
[Myrrhis odorata.]
Ligusticum scoticum.
Crepis paludosa.
Antennaria dioica.
Lobelia Dortmanna.
Pyrola media.
Mertensia maritima.
Lamium intermedium.
Galeopsis versicolor.
Pinguicula vulgaris.
Empetrum nigrum.
Salix pentandra.
Gymnadenia albida.
Listera cordata.
Blysmus rufus.
Carex dioica.
C. limosa.
Elymus arenarius.
Festuca sylvatica.
Equisetum umbrosum.

This is somewhat more than a third of the total list of Northern or Scottish species found in Ireland. The above two sets of species show well the boreal tendency of the flora.

The Atlantic or Western type is poorly represented. Species of this group decrease northwards; thus in Scotland we find about half the number found in Ireland. The development of this type is at its minimum in Donegal, and, strange to say, less than to the east, in Antrim, where the northern type is much better represented also. To this subject I will have occasion to return.

Atlantic Type.

Raphanus maritimus.	Bartsia viscosa.
Viola Curtisii.	Orobanche Hederæ.
Hypericum Androsæmum.	Pinguicula lusitanica.
H. Elodes.	Euphorbia portlandica.
Sedum anglicum.	Scirpus Savii.
Cotyledon Umbilicus.	Lastræa æmula.
(Daucus maritimus.)	Hymenophyllum Wilsoni.
Crithmum maritimum.	

This is less than a third of the total found in Ireland. The flora of Innishowen contains a little above five hundred species. Fifty-six of these belong, as we have seen, to Highland, Northern, and Western types; of the remainder, about fifty belong to Watson's English type, and the remaining four hundred are the commoner or British species.

The following have not previously been recorded from the County Donegal, District 11, of the 'Cybele Hibernica':—

Draba incana.—Sandy ground near the sea between Buncrana and Fahan.

Trifolium arvense.—Sandy fields at Shroove, a little south of Innishowen Head, where it was first found by W. E. Hart; also at Ardmalin Sth., on the west side of Malin Head.

Rubus cæsius.—Banks by the Foyle above Derry, Dr. Moore, Ord. Surv. Rept.

†*Rosa rubiginosa*.—Neighbourhood of Derry; rare, but looking wild, W. E. H.

Sium latifolium.—The locality given under District 12 in the 'Cybele Hibernica,' "Marsh near Culmore Point," belongs to District 11. It is taken from the Ordnance Survey Nat. Hist. Rept. of Derry, by Dr. Moore.

Filago minima.—Sandy warren near Greencastle. Discovered by W. E. Hart, who sent me specimens from this locality, where it is accompanied by *Filago germanica*.

Hieracium crocatum.—Steep banks above the sea near Glenagiveney.

‡*Lamium album*.—A weed at Kilderry, W. E. H.

Ceratophyllum demersum Linn.—In a marsh by the side of the Foyle above Derry, Dr. Moore. This, like *Sium*, has been wrongly allotted to District 12 in the 'Cybele Hibernica."

Amongst the rarities which Innishowen can boast of, there is one, *Bartsia viscosa*, which deserves particular notice. My friend Dean Gwyn first drew my attention to an unusual-looking yellow flower which he observed from the railway, and which proved to be this species. I have already recorded its discovery in the pages of this Journal, and have endeavoured to outline its distribution. This summer I have, however, devoted several days to a botanical survey of the district in which it grows, and I find that my views require modification. The plant was not in flower when I believed I saw the young leaves upon Inch Island, and that part of the habitat is unfortunately erroneously stated.

From near the brick-kiln at Burnfoot, its eastern limit, the *Bartsia* extends across the fields and partly reclaimed swamps to the west of the second embankment (half a mile south of east Inch Road) which it just crosses; a distance of a mile and two-thirds. On the north it is bounded by the Lough Swilly Railway, which it barely crosses a little north of Burnfoot Station, and along which it reaches for about a mile and a half west of Burnfoot. To the southward it extends over fields to within half a mile of Carrownamaddy Meeting-House, and does not appear to cross westwards the main road to Inch from Carrownamaddy. The whole area over which the plant extends is about a square mile, and all of this is land which formerly was below high-water mark. Some of this land has never been broken up, and was left to Nature after it was reclaimed. On this the *Bartsia* is not so plentiful; on fields which have been cropped it is astonishingly abundant. The crops have chiefly been flax and oats, and the land has been reclaimed above thirty years. At one time I was inclined to the opinion that the plant might have been introduced with flax, but that seems unreasonable, since the flax-seed comes from Belgium or Riga, north, I believe, of the range of the plant, and if so introduced, or introduced with any crops, it would certainly have appeared as a colonist elsewhere. Flax is a frequent crop in Donegal; moreover, the seeds are too small, I think, to be likely to be introduced by any of the usual means by which colonists are transported. I have thought it possible that some of the numerous ducks, geese, or waders, which resort here in great numbers in the autumn months, may have touched at Dumbarton or in the Clyde estuary on their southerly migration, and transported the capsule by means of its sticky adherent sepals. This is only guesswork, but Darwin* and others attach importance to this very means of dispersal. Leaving such suggestions, I am still of opinion that the plant grew in smaller quantities on the old coast-margin, or near it, and has spread far and wide over this so suitable an area. Its not occurring now upon ground above the old coast-line is not necessarily important, since places formerly perhaps fit for it have now been much drained, altered, and cultivated, so as to drive the plant outwards to its newly-made home. This has probably been the case with *Potamogeton pectinatus* and *Ruppia maritima*, companions of the *Bartsia*. It will seem strange that a conspicuous flowering plant like the present species has not been recorded before now; it may be thought that this is a proof of its recent appearance, but this part of Innishowen does not appear to have been visited by botanists, nor does it look interesting. The plant, whatever its origin, does not seem to have spread within the last two years, as it might easily have done, but it is perhaps more plentiful where it grows.

It will, I think, be interesting, and throw some light on the question, if I describe the flora of this reclaimed land. The soil is rich and yields good crops and pasturage, but is imperfectly drained

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* 'Origin of Species,' 6th edn., p. 328, *et post*.

and intersected by deep stagnant dykes leading into main drains whose fall is quite insufficient to do more than partially carry off the surplus water. The water of two small, but sometimes much flooded, streams, empties itself into this estuary, the one from low lands southwards towards Derry, the other from a valley running east towards Muff. I examined the banks and marshy spots along these streams for a considerable distance inland, and was able to trace most of the estuary plants to their original habitat. These are chiefly: in the drains *Potamogeton pectinatus*, *P. pusillus*, *Ruppia maritima*, *Myriophyllum alterniflorum*, and *Ranunculus heterophyllus*; and more sparingly, *Utricularia vulgaris*, *Myriophyllum spicatum*, and *Zannichellia palustris*. On the sides of the ditches and elsewhere the chief plants of interest, besides *Bartsia*, are *Ranunculus sceleratus*, *Scrophularia aquatica*, *Œnanthe crocata*, *Epilobium palustre*, *E. parviflorum*, *Phalaris arundinacea*, *Phragmites communis*, *Carex distans*, *C. vulpina*, and *Equisetum maximum*. The number of species on this reclaimed land will be found to be small. Coltsfoot and charlock have become pestilential weeds, as is also the common reed. Several of the above, rare elsewhere in Donegal, are here unusually plentiful, but in most instances I found them in small quantities in the neighbourhood outside the margin of the reclaimed land in a swamp on the east side of the railway south of Bridge End. This is a limited area, and a very trifling amount of drainage would confine the range for a wide area of some of the above to the same grounds as the *Bartsia*.

There is a similarly reclaimed estuary, upon a smaller scale, a couple of miles south of Inch Island along the same shore of Lough Swilly, called Blanket Nook, which I searched for *Bartsia* without success, and I am convinced the plant is confined to the area described.

I may add that I have made fruitless enquiries of all persons in the neighbourhood that seemed likely to be able to give any information upon the subject. I have sought the opinion of other botanists and adopted various suggestions in search of a clue, but the problem is still free to speculate upon. One is tempted to wonder, can this be an extraordinary instance of the well-attested and marvellous power possessed by many seeds of remaining inert until exposed to the influence of sunlight, and that instead of a recently introduced species we have recorded an old inhabitant of a recently submerged flat? *Bartsia viscosa* belongs to a group which probably flourished at a very recent period north of its present limit along the European coasts.

In the foregoing remarks I have expressed my belief that *Bartsia* is native in Donegal; and I am able to show that, though so very local in Ireland, it is one which we should not be surprised to meet in Donegal. It is one of those south and south-west European species which extend up the west coast of Great Britain, failing in numbers as they travel northwards, until a few only have found a home in Scotland. These are classed together by Watson in his Atlantic or Western type, and the group is well represented in most of the maritime counties

of Ireland. Considering the extent of coast-line and the mildness of the Donegal climate, it is remarkable that this type is here at its weakest in Ireland. I expect, however, that further exploration in the west and south-west of the county will strengthen the list. Most of the "Atlantic" plants which reach Scotland occur throughout Ireland, *Sinapis monensis* alone being entirely absent. Of those in Scotland some are widespread, several get no further north than the Clyde Estuary (District XII. of Watson's 'Cybele Britannica'), while two have a further range to Dumbarton and its proximity (District XVI., Watson). These two are *Carum verticillatum* and *Bartsia viscosa*, and all these more northern "Atlantic" plants in Scotland, excepting *Bartsia*, have also been found in the extreme north of Ireland. The range of *Carum* affords a strikingly parallel case. It is commonly found associated with *Bartsia* in Kerry and Cork, the latter being the more abundant there, though not previously found elsewhere in Ireland. On the western side of Great Britain, from Cornwall and Devon to Dumbarton, to which they are strictly confined, their range is local and similar. But *Carum* is found in the north of Ireland, about twenty miles east of Burnfoot in the estuary of the Bann, and again near Belfast, but nowhere else in Ireland. So that the occurrence of *Bartsia* might have been reasonably predicted in the north or north-east of Ireland; and, having been found, the parallelism is complete.

(To be continued).

SHORT NOTES.

Ranunculus ophioglossifolius in England.—In the summer of 1878 I collected near Hythe, South Hants, a specimen of what, at a glance, I took to be a very broad-leaved form of *R. Flammula*, and, in consequence of the large number of other plants then gathered, it was dried and sorted away, as such, without further examination. A short time ago I came across the specimen, and then found it to be *R. ophioglossifolius*. It differs, however, from the continental plant by its less strongly tubercled carpels. The distribution of this species, as given in Nyman's 'Conspectus,' shows it to be a likely plant to occur in Britain, as it reaches north to Gotland, and is found throughout France (including the Channel Islands); it also extends over the greater part of Southern Europe. The out-of-the-way place in which the plant grows in Hampshire makes it improbable that it was introduced, although it did not occur in great quantity, and was only noticed over a small area. Of course the occurrence of a plant in Jersey gives it no claim to be considered "British"; and I think it is to be regretted that our Flora should be artificially enlarged by the addition of species only occurring in what is geographically and botanically a part of France.

The Faroe Islands seem to come more naturally within our district, and it seems worth considering whether, as has been suggested, the plants of these Islands are not best dealt with in 'Floras' including the Shetlands.—H. Groves.

New Irish Rubi.—Quite recently I submitted to Prof. Babington for examination a suite of specimens of *Rubi* collected by Mr. S. A. Stewart and myself in the north-eastern counties of Ireland, which constitute district 12 of the 'Cybele Hibernica.' The results of his investigation proved of extreme interest, yielding at least six species hitherto unrecorded from any part of Ireland. These were :—*Rubus rhamnifolius* W. & N., Blackhead, Co. Antrim ; *R. hirtifolius* Müll. (*pyramidalis* Kaltenb.), Knock, Co. Down, and Lagan Canal, near Belfast ; *R. Grabowskii* Weihe (*carpinifolius* Borr.), second lock, Lagan Canal, near Belfast, Co. Antrim ; *R. Lejeunii* Weihe, hedge between Dunadry and Templepotrick, Co. Antrim ; *R. mucronulatus* Borr., Whiterock, Belfast, Co. Antrim ; *R. foliosus* Weihe, (the typical plant of Bloxam), Tollymore Park, Newcastle, Co. Down. Besides these, the following species, previously recorded from Ireland but not from district 12, may be mentioned :— *R. tuberculatus* Bab., by the Lagan Canal, near Belfast ; *R. Koehleri γ. pallidus* Weihe, Sydenham and Cregagh, near Belfast, Co. Down ; var. *β. infestus* Bab., Castlereagh Hill, Co. Down (not previously recorded as Irish) ; *R. macrophyllus* a. *umbrosus* Arrh., Macedon Point, and Cove Hill quarries, Belfast, Co. Antrim, and Newtonbreda, Co. Down (Mr. Ralph Tate's plant, recorded from this district in 'Cybele,' p. 90, is var. *β. macrophyllus* W. & N.—see 'British Rubi,' p. 157). *R. Salteri* Bab. (typical) occurs in a wood at Shrigley, Co. Down : this species is omitted altogether from the 'Cybele Hibernica' and its Supplement, though Prof. Babington in his 'British Rubi' quotes var. *β. calvatus* Blox., as found frequently in the Co. Derry by the late Dr. David Moore. *R. carpinifolius* W. & N., first recorded from the North-East by myself in July last (*vide* Journ. Bot., 1882, p. 223), has since been found by us to have a widely extended range in the district, occurring even on the Island of Rathlin ; while *R. villicaulis* W. & H., for which only a single locality is given in the 'Cybele,' has also comparatively wide range in Co. Antrim, and likewise extends into Co. Down.—Thos. H. Corry.

Dasya venusta in Britain.—About the end of August last year I found on the beach at Bournemouth three or four plants of a species of *Dasya*. My friend Mr. E. M. Holmes, to whom I forwarded the same, pronounces them to be *Dasya venusta*, and this opinion is corroborated by Mrs. Merrifield ; so that I think there can be no doubt about the correctness of the name. Mr. Grattan mentions in his 'British Marine Algæ' that this plant is occasionally cast ashore on the coast of Sussex, and Mr. Holmes informs me that he finds in Mrs. J. E. Gray's herbarium in the Cambridge Museum specimens of the same plant, gathered at Swanage and Studland in August, 1861. I think therefore that we may now fairly claim the plant as a British species. Mr. Grattan says it is

common in Jersey. Bournemouth is at times a very good place for Algæ. Last summer I found on the beach between Muddiford and Poole fine specimens of *Halymenia Ligula*, *Sporochnus pedunculatus*, *Arthrocladia villosa*, and *Champia parvula*; also *Paonia atomaria*, *Bonnemaisonnia asparagoides*, *Callithamnion roseum*, *Cutleria multifida*, &c.; the most common of all was *Corynospora pedicellata*, of large size. I have said Bournemouth is *at times* a good place for Algæ, because days and days pass without anything worth speaking of being cast up.—Thomas Walker.

Epipogum aphyllum (p. 26).—In reference to Prof. Babington's note on the habitat of this plant in a certain wood near Ludlow, permit me to say that the wood lies on both sides the boundary-line between Shropshire and Herefordshire, there being a very considerable portion on the Shropshire side; and as the lady who gathered the plant does not know in what part of the wood she gathered it, I fear there will be a prolonged contention between local botanists as to which county shall claim it. It will not be politic to enter into a minute description of the locality for obvious reasons, otherwise it would not be difficult to show that the probabilities are as much in favour of one county as the other.—William Phillips. [Prof. Babington learns that he was misinformed. The station for this plant is in Shropshire, very near the borders of the county. He is sorry for this error, into which he was led by information given him at Ludlow.—Ed. Journ. Bot.]

Abstracts.

REPORT OF THE HERBARIUM OF THE ROYAL GARDENS, KEW, FOR 1881.

By Sir J. D. Hooker, K.C.S.I., &c.

Principal additions.—Under this head three gifts of great interest and value require prominent mention:—1. The collection of dried fungi belonging to the late Frederick Currey, M.A., F.R.S., Treasurer of the Linnean Society, presented by his executors in accordance with his wish. This collection, although not very large, is of great value, as it contains the types of many species described by Mr. Currey. 2. The European herbarium of the late George Curling Joad, F.L.S., of Oakfield, Wimbledon Park, presented by his widow in accordance with his wish. The herbarium consisted of two parts, 1, the personal herbarium of Mr. Joad, consisting of plants collected by himself for the most part in Southern and Central Europe; 2, a general European herbarium, formed of published sets of dried plants. 3. The British herbarium of the late H. C. Watson, of Thames Ditton, presented by J. G. Baker, Esq., F.R.S. This herbarium, which will always have a classical interest to students of British botany,

will, like that of Mr. Borrer, be kept as a separate collection apart from the general herbarium. Besides his dried plants, Mr. Baker also presented to Kew a selection from Mr. Watson's books and the beautifully kept manuscript collections for his various published works, which have since been carefully bound for the library.

The following is a list of the names of the other principal contributors to the herbarium during 1881 :—

EUROPE.—Arnold, Dr. F.; lichens (147). Berkeley, Rev. M. J.; 63 drawings of *Agaricineæ*, &c. Buda-Pesth, Herbarium of Hungarian Museum of; Austrian, &c., plants (82). Cooke, Dr. M. C.; miscellaneous fungi (281). Fraser, J., M. D.; *Salices* (2). Furtado, F. d'Arruda; Azores (54). Husnot, T.; French mosses (25). Kunze; miscellaneous fungi (204, purchased). Lacaita, C. C.; Italy (10.) Larbalestier, C.; lichens (80, purchased). Massalongo, Dr. C.; Italian *Hepaticæ* (22, purchased). Oliver, Prof. D.; British (8). Phillips, Wm.; British *Elvellacei* (50, purchased.) Thuemen, Baron von; "Mycotheca universalis" (200, purchased).

ASIA AND INDIAN ARCHIPELAGO.—Aitchison, Surgeon-Major; Afghan and sundry (7). Baber, E. C.; (of H.M. Legation, Peking,) China (1). Beddome, Col.; S. India (54); cultivated *Cinchonæ* (18). Brandis, Dr.; Indian bamboos (2). Cantley, N.; Malay (17). Clarke, C. B.; Sikkim ferns (40). Dickins, F. V.; Japan (395). Duthie, J. F.; Saharunpore Botanic Garden Plants (36). Ellis, Robert; Pangi plants (249), and 2 drawings. Forbes, H. O.; Java (106, purchased). Ford, Chas.; Hongkong and China plants (66), also plants collected in Szechuen by Col. Mesny (22). Hance, Dr.; China, &c. (3). Johnston, Surgeon-Major J. W.; Afghan (41). King, G.; Indian (8). Maximowicz, C. J. de; China, &c. (2). Murray, Jas. A.; *Algæ* from Kurrachee (80). Perry, W. Wykeham, R.N.; China (7). Puckle, Major-General J.; 90 drawings Indian *Glumales*, &c. Regel, Dr.; Central Asia (1). Sander, Messrs.; Philippines (1). Schweinfurth, Dr. G.; South Arabia (82). Sintenis and Rigo, Messrs.; Cyprus (986, purchased). Smith, Hon. C.; Perak (5) and *Antiaris*. Trimen, Dr. H.; Ceylon (1). Veitch, Messrs.; Curtis's Archipelago plants (111). Veitch, Messrs.; Wallis's Philippines (and N. Granada) plants (110). Watt, Dr. G.; India (33). Zohrab, James; Arabia (357).

AFRICA.—Ascherson, Dr. P. (1). Bolus, Harry; Cape of Good Hope. Bowker, Col.; Natal (2). Cosson, Dr. E.; Algeria (196), Morocco (82). Edinburgh, Royal Botanic Garden; Shire Highlands collected by J. Buchanan (638). Floyer, E. A.; Egypt (15). Hurst, H. A.; Egypt and Nubia (10). Kirk, Sir John; East Tropical Africa, and Johanna (23). Portuguese (Government) Polytechnic School, Lisbon, continuation of Welwitsch's Angola collection (416). Saunders, Katherine; Natal (375). Schweinfurth, Dr. G.; Socotra. Tyson, W.; Cape of Good Hope (8). Wood, J. M.; Natal phanerogams (463), fungi (23).

MAURITIUS AND MADAGASCAR.—Baron, Rev. R.; Madagascar

(633). Bewster, C. E.; Bourbon (1). Hildebrandt, J. M.; Madagascar (42, purchased). Horne, J.; Mauritius (2). Parker, Dr. G. W.; Madagascar (420, purchased). Veitch, Messrs.; Curtis's Madagascar plants (20).

North America.—Allen, T. F.; (10). Bennett, A.; (5). Curtiss, A. H.; South United States (200, purchased). Davenport, G. E.; United States Filices (8). Farlow, Dr.; *Algæ* (50). Fletcher, J.; Canada (2). Gray, Prof. Asa; N. American (28), and Schäffner's Mexican collection (719). Greene, E. L.; New Mexico (201, purchased). Haydon, Walter; Hudson's Bay (128). Hemsley, W. B.; Mexico (10). Jones, M. E.; Utah (6). Lemmon, J. G.; Arizona (26). Markham, Capt.; Vancouver's Island. Mott, F. T.; Oregon (7). Palmer, Dr. Edward; Mexico and Texas (1442, purchased; 151, presented). Ravenel; American fungi (200, purchased). Sargent, C. S.; N. American (3). Watson, Sereno; Florida (2).

West Indies and Guiana.—Eaton, Prof.; Bermuda ferns (10). Eggers, Baron; St. Thomas, Dominica, &c. (200, purchased; 510, presented). Farlow, Dr. G.; Bermuda *Algæ* (19). Fendler, A.; Trinidad (807, purchased). Jenman, G. S.; Jamaica (5). Morris, D.; Jamaica (105). Nicholls, Dr. H. A.; Dominica (2). Nock, W.; Jamaica (7). Prestoe, H.; Trinidad (9).

South America.—Foreign Office; Paraguay, *Pilocarpus* sp. Geheeb, A.; Brazil mosses (10). Glaziou, A.; Brazil (620). Kalbreyer,—.; New Granada (93). Lorentz, Dr. P. G.; Uruguay (53, purchased). Sander, Messrs.; Columbia, &c. (17). Schrader, August; Venezuela, *Musci* (145), purchased).

Australia.—Hartman, C. H.; sundry cryptogamia (20). Merrifield, Mrs. Mary P.; *Algæ* (5). Mueller, Sir F.; 8 phanerogams and 101 fungi.

New Zealand.—Cheeseman, T. F. (44). Hector, Dr. (10).

Polynesia.—Department, Agriculture, U.S.A., Wilkes' Grasses (95). Storck, J. P.; Fiji (9).

THE ROYAL BOTANICAL GARDEN, GLASNEVIN, DUBLIN.

The 'Twenty-ninth Report of the Science and Art Department of the Committee of Council on Education,' dated 3rd July, 1882, has lately come into our hands. We find in it a report of the condition of the Botanic Garden, Glasnevin, Dublin, which in some respects is very unsatisfactory. The Garden itself, as every one who has visited it knows, is maintained in a high state of efficiency by the energetic Curator, Mr. F. W. Moore; but the following statement by Dr. W. R. McNab, the Professor of Botany at the Royal College of Science, will show that there are matters connected with the Gardens which require immediate attention. Dr. McNab write :—"The want of a proper library, herbarium, museum, and offices, was prominently brought before the Visitors at their visitation on the 11th of March, 1881. A new building to replace the present offices and temporary museum is required for the accommo-

dation, first, of a reference herbarium; second, a museum of such parts of plants as cannot be prserved in the herbarium; third, a reference library; and fourth, suitable offices. At present the herbarium is kept in the office. The plants are merely tied up in bundles, are very difficult of access, and liable to injury from damp, dust, and other causes. As a step towards the formation of a proper herbarium, cases ought to be provided for the collection without delay. Part of the collection which should properly be at the garden is at present stored in the Museum of Science and Art, and I think that steps should be taken to render the late Admiral Jones's collection of lichens accessible to the student." Dr. McNab calls attention to the deficiencies of the library, instancing as examples of books required the recent volumes of the 'Botanical Magazine,' which is complete down to 1878, the 'Flora Australiensis,' the 'Flora of British India,' and the 'Journal of the Linnean Society,' Such a state of affairs is hardly creditable to the chief botanical establishment in Ireland. He concludes his statement with this sentence:—"Botanical science is but little appreciated in Ireland, and it is only by having a properly equipped botanical establishment that any impetus will be given to the study of the subject."

Mr. Moore bears out this melancholy testimony to the existing state of things:—"The plants," he says, "are tied in bundles, and put where room can be found for them. The place is so damp that many valuable plants were completely lost during the year, and they must continue to deteriorate unless suitable cases be provided for them."

We learn from Mr. Moore that the Herbarium contains, among other collections, a large series of Irish Phanerogams and Ferns, formed by the late Dr. Moore, and of especial value in connection with the 'Cybele Hibernica'; a full collection of Irish Musci and Hepaticæ, mounted and arranged—the latter prepared for microscopical examination; collections of Irish Lichens and Mosses, formed by Dr. Taylor and Admiral Jones; European Hepaticæ and Mosses, from Lindley, Hepp, Rabenhorst, Wilson, and G. E. Hunt; and other plants from various parts of Europe. We trust that something may be done, and that without delay, to save the collections from the ruin which seems impending.

Notices of Books.

Origine des Plantes Cultivées. Par Alph. DeCandolle. Paris Bailliére, 1883 [1882].

This most useful and interesting volume demands a more complete notice than the present demands upon our space will permit us to bestow upon it. We are glad to know that an English edition is in active preparation, and we shall delay until

its appearance any remarks which suggest themselves. But we may say briefly that M. DeCandolle has here worked out the history, ancient and modern, so far as it can be ascertained, of all cultivated plants of importance, amounting in number to nearly 250. Every page bristles with interesting facts and details bearing upon the subject; and the number and variety of the authorities cited show that the learned author has left no source of information unexplored. The following enumeration of the species which are unknown, or but doubtfully known, in a wild state, will, we think, be of interest to our readers, showing, as it does, the various degrees of uncertainty attaching to the various groups. A hundred and sixty-nine out of the 247 species enumerated are placed by M. DeCandolle in his first group, which he defines as consisting of "Spontaneous, that is to say wild species, seen by numerous botanists far from houses and cultivation, having all the appearance of indigenous plants, and under a form identical with one of the varieties cultivated. These number 169: 31 of them are of very ancient cultivation; 56 have been cultivated less than 2000 years, and the others are of mediæval or unknown date." The remaining 78 species are grouped as follows:—

II. Seen and collected in the same conditions, but by only one botanist and in only one locality—3.

Cucurbita maxima, *Faba vulgaris*,† Nicotiana Tabacum.

III. Seen and mentioned, but not collected, in the same conditions, by one or two more or less ancient non-botanical authors, who may have been mistaken—2.

Carthamus tinctorius, *Triticum vulgare*.

IV. Collected wild by botanists in several localities, under a form slightly differing from those cultivated, but which most authors would not hesitate to rank as the same species—4.

Olea europæa, *Oryza sativa*, Solanum tuberosum, *Vitis vinifera*.

V. Wild, collected by botanists in several localities, under forms considered by the authors as constituting different species, although others treat them as varieties—15.

Allium Ampeloprasum Porrum, *Cichorium Endivia var. *Crocus sativus* var., *Cucumis Melo, Cucurbita Pepo, Helianthus tuberosus, Lactuca Scariola sativa, *Linum usitatissimum annuum*, Lycopersicum esculentum, Papaver somniferum, Pyrus nivalis var., *Ribes Grossularia, Solanum Melongena, *Spinacia oleracea var., Triticum monococcum.

VI. Subspontaneous, that is to say, almost wild, resembling one of the forms cultivated, but with the possibility that they may have escaped from cultivation, owing to local causes—24.

† The italicised species are of very ancient culture: those preceded by * have been cultivated for less than 2000 years.

Agave americana, Amaranthus gangeticus, *Amygdalus Persica*, Areca Catechu, *Avena orientalis, Avena sativa, *Cajanus indicus, *Cicer arietinum*, Citrus decumana, Cucurbita moschata, Dioscorea japonica, Ervum Ervilia, *E. Lens*, Fagopyrum emarginatum, Gossypium barbadense, Holcus saccharatus, *H. Sorghum*, Indigofera tinctoria, Lepidium sativum, Maranta arundinacea, Nicotiana rustica, *Panicum miliaceum*, Raphanus sativus, Spergula arvensis.

VII. Subspontaneous like the preceding, but in a form so far different from the cultivated varieties that most authors regard them as distinct species—3.

* Allium ascalonicum (form of *A. Cepa ?*), * Scorodoprasum (form of *A. sativum ?*), Secale cereale (form of one of some perennial Secale ?

VIII. Not discovered in a wild or even in a subspontaneous state, having perhaps originated since the beginning of the cultivation of plants, but too different not to be usually regarded as species—3.

Hordeum hexastichon (derived from *H. distichon ?*), *H. vulgare* (derived from *H. distichon ?*), *Triticum Spelta* (derived from *T. vulgare ?*).

IX. Not discovered in a wild, or even in a subspontaneous state, but originally from insufficiently explored countries, and likely to become united later on with wild species, at present not well known, from those countries—6.

Arachis hypogæa, Caryophyllus aromaticus, *Convolvulus Batatas*, * Dolichos Lubia, Manihot utilissima, Phaseolus vulgaris.

X. Not discovered in a wild, or even in a subspontaneous state, but originally from insufficiently explored countries, or from countries of the same nature which are somewhat indefinite, more distinct than the preceding from known species—18.

Amorphophallus Konjak, Arracacha esculenta, Brassica chinensis, Capsicum annuum, Chenopodium Quinoa, Citrus nobilis, Cucurbita ficifolia, Dioscorea alata, D. Batatas, D. sativa, Eleusine Coracana, Lucuma mammosa, Nephelium Litchi, * Pisum sativum, Saccharum officinarum, Sechium edule, * Trichosanthes anguina, Zea Mais.

We hope to return later to, and to give further extracts from, this very important contribution to our knowledge of the history of cultivated plants.

The Botanical Exchange Club of the British Isles. Notes on the plants gathered in 1881. Edited by F. Arnold Lees, M.R.C.S., L.R.C.P., F.L.S. Manchester: James Collins [Dec.] 1882.

The 1881 report is distinctly wanting in the interest which usually attaches to the issues of the Exchange Club. There is an almost entire absence of the critical notes by more or less competent observers which have hitherto rendered the Reports valuable

to critical botanists, and which we have from year to year transferred to our columns. On this occasion we find little which we can profitably extract, although the notes on the specimens distributed will be of interest to those who possess the plants to which they refer. Mr. Varenne sends examples of *Brassica Briggsii* from Penzance (see Journ. Bot., 1881, p. 360); Dr. Boswell notes that *Rubus spectabilis*, recorded by Mr. Melvill as occurring in Kent (Journ. Bot., 1881, p. 251), is "naturalised in many places in Arran"; the hybrid thistle (*Carduus palustris* × *heterophyllus*), which Mr. Jenner called *C. Carolorum*, has been cultivated at Balmuto, a single specimen having been brought from Glen Garry; Mr. Purchas reports *Daphne Mezereum* "amongst bushes on a steep, stony hillside, apparently truly wild, near Alstonfield, Stafford." Of an *Alopecurus* sent by Mr. E. F. Linton from "Bottesford to Belvoir Castle, Leicester, Mr. Lees says "I have examined it carefully, and from its size (4 ft.), villose-ciliate united glume, long awn, and creeping runners, I call it *nigricans*, Hornem." Mr. Leefe says of a Willow sent by Dr. Fraser from Tattenhall, Wolverhampton, "I consider your plant to be *Salix holosericea* Willd., not Hook. I never saw a British specimen before"; and Dr. Boswell confirms this identification. We are sorry to see that Mr. Lees adds a new synonym to the interesting sedge figured and described by Mr. Ridley (Journ. Bot. 1881, p. 97, tab. 218) as *Carex pilulifera*, var. *Leesii*. Mr. Lees now calls this plant "*C. pilulifera*, var. *saxumbra* Lees (1880)." This is erroneous; Mr. Lees published the plant, not as a variety, but as a species, with the *specific* name *Saxumbra*. If retained as a species, that name must of course stand, although Mr. Lees himself has since quoted it has "*C. Leesii* Ridley" (see Journ. Bot. 1882, p. 93); but if the plant is a variety of *pilulifera*, there is no possibility of setting Mr. Ridley's name aside. Dr. Boswell notes upon the specimens sent (from the original locality at Plumpton) to the Club—"Certainly a most remarkable form; the glumes are so totally unlike those of ordinary *pilulifera*. It is desirable the plants should be cultivated to see if it be not distinct."

The Colours of Flowers as illustrated in the British Flora. By Grant Allen. London: Macmillan. 1882.

This is a very readable little volume, the contents of which have already appeared in 'Nature,' and are now reprinted in the 'Nature Series.' The opening chapter is devoted to the statement of a theory that petals are derived from flattened and abortive stamens. Mr. Allen puts this view before us with much plausibility; but we do not think botanists will be convinced that the generally accepted theory has been disproved. The bulk of the little volume is occupied with a very interesting analysis of the colours of our British flowering plants. Mr. Allen considers that "all flowers were in their earliest form yellow; then some of them became white; after that, a few of them grew to be red or purple; and finally, a comparatively small number acquired various shades of

lilac, mauve, violet, or blue": these last being the most highly developed. It is unnecessary to say that Mr. Allen tells his story in an attractive manner; and his conclusions follow naturally enough if we accept the premises upon which they are based. But Mr. Allen's notions of the colour of many flowers seems to us far from accurate. We do not agree with him in thinking that the petals of the cherry are "usually deeply tinged with pink" (p. 30); we should not call the flowers of *Lobelia Dortmanna* "sky blue" or those of *L. urens* "dingy purple" (p. 48); it is not the "throat," but the upper lip, of *Linaria spuria*, that is "purple" (p. 68); the flowers of *Hesperis matronalis* are not "a fine purple" (p. 44); the red of the apple-blossom is more than a "slight blush" (p. 75). These are small matters, and would be of no importance did not Mr. Allen base theories upon them. Thus he says, "Sometimes we may say that the new colour has not yet begun to fix itself in the species, but that the hue still varies under our very eye. Of this the little milkwort (*Polygala vulgaris*) affords an excellent example, for it is occasionally white, usually pink, and frequently blue. Here we may fairly regard the pink as the normal hue, while the white is doubtless due to reversion, and the blue to progressive modification, not yet fully selected by insects; so that in all probability it is now actually in course of acquiring a new colour" (p. 74). We think it would be generally admitted that the milkwort is more frequently blue than any other colour. Mr. Allen speaks of "*Cephalanthera grandiflora* and most other British species" of Orchids as being "very diversified in colour"; his description of *Aceras anthropophora* as having "green sepals and petals, edged with red, and a yellow lip, pink fringed" (p. 70), would convey to any one who did not know the plant a by no means accurate impression. He tells us that "floating plants tend as a rule to become green-flowered" (p. 102); but this rule is surely "more honoured in the breach than in the observance" when we take into account such floating plants as the water-lilies, *Hydrocharis*, *Limnanthemum*, *Polygonum amphibium*, *Hottonia*, *Alisma natans*, *Batrachium*, and *Utricularia*. It appears to us that Mr. Allen is little prone to bend facts so as to fit them in with his own theories. He might well take a lesson from Mr. Darwin in this matter; and his conclusions will be more valuable if they are based on a larger amount of observation.

A Handbook of Cinchona Culture. By Karel Wesel von Gorkom, formerly Chief Inspector of Cultures in the Netherlands East Indies. Translated by Benjamin Daydon Jackson, Secretary of the Linnean Society of London. Amsterdam: Bussy. London: Trübner. 1883 [1882]. 8vo, pp. [viii.] 292.

The indefatigable Secretary of the Linnean Society has found time, in spite of his numerous duties, to translate this important book from the original Dutch. The title, although correct so far as it goes, hardly gives a fair idea of the work, which deals not only with the culture of Cinchona, but includes its early history,

descriptions of the various species, an account of the introduction of Cinchona into Java, the preparation of Quinine, and kindred subjects; as well as—last, but certainly not least in importance—a capital index, for which the translator is, we believe, to be thanked. It will thus be seen that, although the work is thus primarily intended for the use of those engaged in the cultivation of Cinchona, it yet deserves also to find a place on the shelves of the student of applied botany.

It is a little disappointing to find the author saying, "We do not attempt a bibliography of the subject *Cinchona*": these bibliographies of special subjects are very useful, and we should have been glad if Mr. Jackson had seen his way to give something of the kind in an appendix, for which his 'Vegetable Technology' would have afforded material sufficient for a basis. Only three works are recommended for consultation—a selection which seems to us very insufficient. *Cinchona Ledgeriana*, which has been the subject of two papers in this Journal, is treated as a form of *C. Calisaya;* Mr. Jackson in a footnote refers to Dr. Trimen's description of the plant as a species—showing that the translator does not confine himself to the information given by Van Gorkom.

The volume is beautifully got up, and the typographical errors are very few, considering that the work was printed abroad. Appealing to but a small circle, it is not to be wondered at that the work is expensive; but its general style leaves little doubt in the mind that those who take an active interest in Cinchona culture will find this 'Handbook' indispensable.

We have received a copy of the new edition of Dr. Smiles's 'Life of a Scotch Naturalist, Thomas Edward, A.L.S.' (London: Murray, 1882), from which the 'Fauna of Banffshire' is omitted; the general reader, however, is more than compensated for the absence of this by the addition of a new preface, containing much interesting matter, especially portions of an admirable address lately delivered by Mr. Edward to the boys of a school near Liverpool. Mr. Edward's botanical collection came to an untimely end. In 1845, when "he went to overhaul the box" which contained about two thousand specimens—the result of eight years' labour—"he found that the lid had been shoved to one side, and that numerous cats had entered it and made it their lair: the plants were completely soaked and rendered utterly worthless." Although he replaced them "to a certain extent," he does not seem to have devoted special attention to botany after this. Not the least remarkable circumstance connected with this most interesting volume is the fact that no fewer than four translations of it have appeared in Russia. The book abounds with anecdote and suggestion, and should be in every good library. We notice in a recent (December) newspaper the announcement that Mr. Edward has resigned the Curatorship of the Banff Museum, which he had held for thirty years.

The English Dialect Society has issued to its members a reprint of the very interesting 'Glossary of Devonshire Plant-Names,' contributed by the Rev. Hilderic Friend to the volume for 1882 of the 'Transactions of the Devonshire Association.' It contains, as might be expected, many additions to Britten and Holland's 'Dictionary of English Plant-Names,' issued by the same Society, and is very carefully done. Mr. Friend quotes from a local book a sentence—"The 'thormantle,' excellent as a medicine in fevers,"—and says, "it would be interesting to know exactly what flower is meant." There is little doubt but that the Tormentil (*Potentilla Tormentilla*) is intended, and Mr. Friend's idea that the name has some allusion to Thor must, we fear, be abandoned.

The last part (Vol. III., part 3) of the 'Transactions of the Norfolk and Norwich Naturalist's Society' contains a memoir, with portrait, of Samuel Pickworth Woodward, by his son, Mr. Horace B. Woodward. Although chiefly known by his 'History of Mollusca,' Mr. S. P. Woodward, especially in early life, paid some attention to botany. When about fifteen, he was employed by Dawson Turner in the arrangement of his herbarium, and he subsequently "formed a large and valuable herbarium himself, which was ultimately purchased for the Royal Agricultural College at Cirencester." His name is associated with the doubtful thistle called by Mr. Watson (Cyb. Brit., ii., 83), provisionally, *Carduus Woodwardii;* this was found by Mr. Woodward, near Swindon, in 1848. He was born at Norwich, on Sept. 17th, 1821, and died at Herne Bay, July 11th, 1865. Other papers of botanical interest are, 'The Lombardy Poplar and its destruction in Norfolk in the winter of 1880': by Herbert D. Geldart; and 'Lists of Norfolk Naiadaceæ and Characeæ,' by Arthur Bennett, F.L.S. The local character of these Transactions is a very satisfactory feature.

Articles in Journals.

Annales des Sciences Nat. (6 Sér. xiv. nos. 5 & 6.—Dec.). — L. Mangin, 'Origine et insertion des racines adventives' (tt. 9–16, concluded). — E. Fournier, 'Sur les Asclépiadées americaines' (*Astephanus nigrescens*, *A. peruvianus*, *A. streptocarpus*, *Esmeraldia* (gen. nov.) *stricta*, *Hemipogon peruvianus*, *Asclepias salticola*, *A. barjoniæfolia*, *A. otarioides*, *A. ramosa*, *A. Virletii*, *A. grandiflora*, *A. pellucida*, *A. Weddellii*, *A. pallida*, *A. multinervis*, *A. Bridgesii*, *A. Curupi*, *Acerates Schaffneri*, *A. vinosa*, *Funastrum* (gen. nov.) *suffrutescens*, spp. nn.).—(xv. no. 1 (Jan.) J. Vesque, 'Observation directe de mouvement de l'eau dans les vaisseaux.' — F. Elfving, 'Sur le transport de l'eau dans le bois.'—J. H. Fabre, 'Sphériacées du departement de Vaucluse' (*Requienella*, gen. nov.).

Botanische Zeitung. — T. W. Engelmann, 'Farbe und Assimilation.'—H. G. Reichenbach, '*Spiranthes euphlebia*," n. sp.

Botanisches Centralblatt. — E. Russow, 'Zur Kenntniss des Holzes, insonderheit des Coniferenholzes' (5 plates).

Bull. Soc. Roy. Bot. Belgique (xxi., pt. 2, Dec. 28). — A. Cogniaux, 'Note sur le genre *Waren* C. B. Clarke' (the name

having been preoccupied, M. Cogniaux proposes *Biswarea* in its place).—M. Michel, 'Les plantes naturalisées ou introduites dans la vallée de la Vesdre.' — L. Piré, 'Spicilége de la Flore Bryologique de Montreux-Clarens.'—C. H. Delogne, 'Mosses new to Belgium.' —Id., '*Calypogeia arguta* in Belgium.'—M. Marchal, 'Direction de la tige de l'*Utricularia intermedia*.'—C. Delogne & Th. Durand, 'Les Mousses de la Flore Hégeoise.' — A. Déséglise, '*Menthæ Opizianæ*.' —Th. Durand, 'Découvertes Botaniques faites pendant 1882.'

Bull. Mensuel de la Soc. Linnéenne de Paris, No. 41. — H. Baillon, 'Les Orchidées à colonne tordue.' — Id., 'La fleur des Pervenches' (*Vinca*).—Id., 'Sur les limites du genre *Genista*.'—Id., 'La corolle des *Corrigiola*.' —Id., 'La sygénérie des *Symphyandra*.' —Id., 'Les fleurs mâles du *Sicyosperma gracile*.' —L. Durand, 'La fleur des *Polygonatum*.'—Id., 'Les étamines des *Agraphis*.'—No. 42. A. Franchet, 'Sur quelques *Delphinium* de la Chine' (*D. Callerii*, *D. Savatieri*, spp. nn.).—H. Baillon, 'Liste des plantes de Madagascar' (*Ranunculaceæ* and *Dilleniaceæ*: *Clematis insidiosa*, n. sp.).—Id., 'L'Hermaphroditisma apparent de certains *Kadsura*.' — Id., 'Sur le section *Torquearia* du genre *Genipa*.'—Id., 'Dissémination des graines du *Tamus communis*.' —Id., 'Sur les Clématites à préfloraison imbriquée.' —Id., 'La Polyembryonie du Dompte-Venin' (*Vincetoxicum officinale*).

Bulletin of Torrey Botanical Club (Dec.). — E. L. Greene, '*Holozonia filipes*.' — F. L. Scribner, 'Grasses collected by C. C. Pringle in Arizona and California' (contd.). — S. H. Wright, 'New variety (*impressa*) of *Carex riparia*.' — T. Meehan, 'Prolification in the Carrot.'

Flora (Jan. 1).—C. Kraus, 'Untersuchungen über den Säftedruck der Pflanzen' (contd.).—H. G. Reichenbach, '*Spiranthes euphlebia*,' sp. n., from Brazil.—(Jan. 11). J. Müller, 'Lichenologische Beiträge xvii.' (Australian and New Zealand Lichens: *Cladonia squamulosa*, *Ramalina lacerata*, *R. myriocladа*, *Nephromium tropicum*, *Sticta flavissima*, spp. nn.). — (Jan. 21). E. Kutscher, 'Ueber die Verwendung der Gerbsäure im Stoffwechsel der Pflanze' (2 plates).—J. Müller, 'Lichenologische Beiträge xvii.' (cont.: *Ricasolia Hartmanni*, *Parmelia pruinata*, *P. xanthomelana*, spp. nn.).

Gardeners' Chronicle (Jan. 6).—'*Masdevallia porcelliceps* Rchb. f., sp. n.; *Anthurium crassifolium* N. E. Br., sp. n.; *Schaueria flavicoma* N. E. Br.' — (Jan. 13). N. E. Brown, 'Cross-fertilisation of *Justicia campylostemon* T. And.' — Id., 'A wild double Oxalis' (*O. semiloba*), *Pinus contorta* (fig.); 'List of Garden Orchids' (*Cœlogyne* contd.); '*Vitis gongylodes*' (fig.). — (Jan. 20). N. E. Brown, '*Haplocarpha Leichtlinii*, n. sp. (*Gorteria acaulis* Hort.); *Dahlia excelsa* (fig.)—(Jan. 27) *Masdevallia torta* Rchb. f., sp. n.; *Liparis grossa* Rchb. f., sp. n.; *Primula floribunda* Wall. (fig.); *P. obconica* Hance (fig.).

Hardwicke's Science-Gossip.—C. B. Plowright, 'British Bramble *Phragmidia*' (illustrated).

Magyar Növénytani Lapok (Dec.). — J. Pantocsek, 'Notulæ

præviæ de novis Hungariæ plantis' (*Anthyllis carpatica*, *Knautia Kossuthii*, spp. nn.).

Michelia (Dec.).—O. Penzig, 'Funghi Agrumicoli.'—A. Berlese, 'Index alphabeticus fungorum italicorum autographice delineatorum auctore P. A. Saccardo' (1–1280).—P. A. Saccardo, 'Fungi Veneti novi v. critici v. Mycologiæ Venetæ addendi (adjectis nonnullis extra-venetis), Series xiii.'—Id., 'Fungi boreali-americani.'—Id., 'Fungi gallici.'

Midland Naturalist.—M. J. Berkeley, 'On Underground Fungi' (3 plates). — G. C. Druce, 'Visit to Glen Clova and Callater.' — J. E. Bagnall, 'Flora of Warwickshire' (contd.).

Œsterr. Bot. Zeitschrift. — M. Příhoda, 'Carlo de Marchesetti' (portrait).—A. Tomaschek, 'Zu Darwin's "Bewegungsvermögen der Pflanzen"' (contd.).—D. Hirc, 'Flora von Fiume' (concluded). — S. S. v. Müggenberg, '*Agaricus* (*Lepiota*) *Letellieri* und ihm ähnliche Formen.'—P. G. Strobl, 'Flora des Etna' (contd.).

Botanical News.

The Herbarium of the late Rev. G. E. Smith has been acquired by University College, Nottingham.

Dr. Marcus M. Hartog has been appointed Professor of Natural History at Queen's College, Cork.

We understand that a new edition of Sir Joseph Hooker's 'Student's Flora' is in preparation.

During the past year the University of Upsala has purchased, for the sum of £1250, the greater part of the Herbarium of the late Professor E. Fries. A Scandinavian phanerogamic herbarium and a collection of mosses and algæ, also from Fries's herbarium, have been presented to the Upsala Botanical Museum by an anonymous benefactor. Dr. Oscar Dickson has purchased and presented to the same museum the very important collection of Scandinavian mosses and algæ formed by J. and C. Hartman.

The Herbarium of the late Prof. Decaisne, as well as his manuscripts and drawings, has been presented by his brother to the 'Jardin botanique de l'État' at Brussels.

M. Gandoger announces his intention of publishing a work entitled 'Flora Europæa.' It is to extend to from fifteen to eighteen volumes, the first of which will appear during the present year, while the whole will be completed in about twelve years. We look forward with alarm to the myriads of new and useless names which this publication is almost certain to bring upon us.

The first volume has been issued of a work upon Brazilian Orchids, by M. J. B. Rodrigues, entitled 'Genera et species Orchidearum novarum.'

MM. Favrat, of Lausanne, propose to publish sets of the Rubi of the South-east of Switzerland, for which they will make collections during the coming summer.

Tab. 235.

A Bennett del
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West Newman & Co imp

Potamogeton Griffithii. A. Benn.

Original Articles.

TWO NEW POTAMOGETONS.

By Arthur Bennett, F.L.S.

(Tab. 235.)

Potamogeton Griffithii, n, sp.—Stem branched, 2–3 ft. long. Lower leaves alternate, sessile, slightly clasping, strap-shaped, hooded at the apex when fresh, entire, slightly undulated, 11-veined, with 4–5 fainter veins close to the midrib, semitranslucent. Upper (floating) leaves opposite, long-stalked, oblanceolate, gradually attenuated into the long petiole, 13–17 veined with distinct areolation over the whole surface, more conspicuous towards the midrib. Stipules long, narrow, blunt. Peduncles moderately slender, distinctly narrowed towards the base of the spike, slightly enlarged towards the centre. Spike cylindrical, densely flowered. Sepals roundish-oval, broader than long. Young fruit oval, with the beak forming the continuation of the inner edge. Ripe fruit not seen. Submerged leaves tinged with yellowish brown. floating leaves green. Lower leaves 7–12 in. long, $\frac{1}{2}-\frac{3}{4}$ in. broad; lamina of the floating leaves 3–5 in. long, petiole 2–4 in. long. Stipules 2 in. long. Peduncles $2\frac{1}{2}$–5 in. long. Spike $\frac{1}{2}$–1 in. long.

The plant has the habit of *P. prælongus* Wulfen. The floating leaves much resemble those of the N. American *P. Claytonii* Tuck.; the submerged, those of *P. longifolius* Bab. (not of Gay!), but the apex of the leaves in *P. Griffithii* is decidedly boat-shaped, although not so much so as represented in the plate. I examined most of the broad-leaved Potamogetons in a fresh state last autumn, to see if there was any tendency to this boat-shaped apex of the leaf, but cannot find it in any except *prælongus* and *Griffithii*. There does not seem to be any approach to floating leaves in *P. prælongus* among the numerous specimens I have examined from N. America and Europe; the nervation of the leaves and spikes of *Griffithii* is also totally different. Hab. Llyn-an-Afon (better known locally as Aber Lake), near Aber, Carnarvonshire, North Wales, alt. 1250 feet. June, August, October, 1882. Mr. J. E. Griffith.

When Mr. Griffith sent me the first specimens I was strongly inclined to refer them to *P. longifolius* Bab.; but on his visiting the locality (which is somewhat difficult of access) twice afterwards, and kindly sending me a supply of specimens in the fresh state and with floating leaves, I saw it could not be so referred. Later I thought it might possibly be a hybrid between *prælongus* and *rufescens*, though I am a decided opponent of referring every uncertain plant to a hybrid origin; but Mr. Griffith especially

searched for either of these species without success, and he informs me that the water is so clear that by ascending the mountain side you can see the bottom of the lake and its vegetation plainly.

It is difficult to believe in a plant being wholly confined to a single Welsh lake, and the alteration that may take place by isolation should be well considered, especially after the evidence Mr. F. Day has brought together from the zoological point, *i. e.*, among the British *Salmonidæ*. Still it is impossible to refer Mr. Griffith's specimens to any known species of *Potamogeton*, and equally so to place it under any species as a sub-species.

Potamogeton Cheesemanii, n. sp.—Stem simple (?), striated, internodes strongly marked by an irregular annulus. Lower leaves alternate, strap-shaped, gradually attenuated into the petiole, less so at the apex, not denticulate, 5–7 veined, connected with few cross veins, semitranslucent; upper leaves (opposite where the peduncles are given off) varying from lanceolate to oval, the uppermost coriaceous, 11–15 veined, with very numerous cross veins, and close areolation all over the leaf when held against the light. Stipules broad, subacute, very translucent, and soon decaying. Peduncles rather slender, slightly thickened towards the middle; spikes dense flowered, oblong-cylindrical, sepals (perianth leaves) transversely rhombic-orbicular. Fruit small, roundish ovate, slightly compressed, carinated on the back, with a short terminal beak. Embryo curved to one-half its base. Lower leaves $2\frac{1}{2}$–4 in. long, $\frac{1}{4}$–$\frac{3}{8}$ in. broad; lamina of the upper leaves 1–$1\frac{3}{4}$ in. long. Peduncles 2 in. long. Fruiting spikes $\frac{3}{4}$ in. long.

Habitat.—New Zealand, St. John's Lake, North Island, December, 1881; Mr. T. F. Cheeseman, to whom I am indebted for a fine series of the plant.

Unnamed specimens from Mr. Kirk are in the Herbarium at Kew; and an incomplete specimen in Herb. Brit. Mus., from Colenso, is probably the same.

Affinity with *P. natans*, *polygonifolius*, &c., having a superficial resemblance to *P. natans*, var. *minor* Hook. Fl. Tasmania (non M. et K.*) ii. 41; but the specimen in Herb. Kew., and one in my own collection (for which, with other Australian species, I am indebted to Sir F. Mueller), have the leaves quite those of the Linnean type except as to size. Typical *natans* L. and *polygonifolius* Pour. both occur in New Zealand!

Potamogeton perfoliatus L., var. *Jacksoni* F. A. Lees in Rep. Bot. Rec. Club, 1880, p. 150.—This curious variety, as I think, of *perfoliatus* was found by Mr. Jackson, of Wetherby, in a pool near the river Wharfe, west of Linton Common, Yorkshire. Dr. Lees and the discoverer both sent me specimens of it, accompanied by a note from Professor Babington, in which he suggested it being an abnormal form of *nitens* or *prælongus*. I was quite unable to match it in our herbaria, and made some remarks on it in the

* Chamisso ('Linnæa,' 1827, p. 216) refers this to *P. oblongus* Viv. (*polygonifolius* Pour.), but it belongs to *natans* L. herb., as an authentic specimen from Nolte shows.

Report referred to; and I should not have again noticed the plant had not the Rev. T. Morong (to whom I sent a scrap and a sketch of Mr. Jackson's specimens) written me that a plant from Wenham Lake, U.S.A., much resembled my specimen and drawing, and suggesting whether it "might not be regarded as a young autumnal *P. prælongus* Wulf." I still think it has nothing to do with *prælongus* Wulf.; the apices of the leaves are not like that, and the nervation is quite like *perfoliatus*. It will be interesting if Mr. Jackson can succeed in getting it in fruit, in which as yet he has not been successful.

Explanation of Plate 235.—*Potamogeton Griffithii*.—1. Plant nat. size. *a*. Half-ripe fruits; one taken away to show others. *b*. Perianth-leaf (sepal). *c*. Structure of the leaf.

ON *SPHÆRELLA* AND ITS ALLIES.

By M. C. Cooke, M.A., LL.D.

The genus *Sphærella*, as originally proposed and accepted, was a tolerably natural one, including such species of the old genus *Sphæria* as grew upon leaves, or the green and succulent parts of plants, the perithecia being small, more or less membranaceous, with oblong or elliptical sporidia of two to four cells, sometimes only one, hyaline or slightly coloured. These were, in fact, the limits proposed by De Notaris, and no very strong objection could be urged against them. But Saccardo was not content, and in his recent 'Sylloge' he has split it up over five or six genera, in conformity with his monomaniacal idea.

Nevertheless, we purpose to attend more to his species than to his genera in the following remarks, and shall on this occasion apply ourselves principally to two, that is, *Læstadia*, or species of *Sphærella* with simple spores, and *Sphærella*, including the species with bilocular spores; the species with a larger number of cells must wait a future opportunity, when the second volume of the 'Sylloge' is published. We purpose regarding all as *Sphærella*, according to Notaris, grouping them in subgenera under the names adopted by Saccardo, thus:—

Sphærella, DeNot.

One-celled = subgen. *Læstadia*
Two-celled = ,, *Sphærella*
Three-celled= ,, *Sphærulina*.

and so on. This will permit of the combination of all that is good and practicable of the artificial system with the natural.

The two first-named subgenera include in the Sylloge—

Læstadia . . . . 59 species
Sphærella . . . . 279 ,,

As to the soundness of basing generic distinctions on the sporidia, we will only remind its adherents of one fact. well known to all who have had botanical experience, especially with the

cryptogamia, that the natural tendency of the vegetable cell is that of undergoing septation. The spore is a vegetable cell, inheriting a natural tendency towards subdivision. How far then can it possibly be philosophical to adopt such an unstable element as a vegetable cell as the fundamental base of a system of classification?

Of the 337 species in the 'Sylloge,' about 100 are unknown to us; of these, 50 at least belong to very recent Italian species, of which nothing is known in other parts of Europe, except the names and descriptions, specimens never having been published or distributed. Some of the remaining 50 are species long ago described, perhaps imperfectly, but which cannot be regarded as other than doubtful.

Our remarks on the species are made in the order in which they are published in the 'Sylloge,' with the intercalated species denoted by an asterisk. We do not pretend to have examined other genera, except casually, where we have recognized a species in our opinion misplaced. Hence we hazard no opinion concerning the species included under them, or whether any belong properly to *Sphærella*.

1*Sphærella (*Læstadia*) stigmatodes B. & C. — Hypophylla. Peritheciis sparsis, punctiformibus, *Sph. punctiforme* simulantibus. Ascis clavato-cylindricis. Sporidiis arcte ellipticis, obtusis, continuis, hyalinis (008–01 × 002–0025 mm.)

On leaves. Maine, U.S.

9*Sphærella (*Læstadia*) albocrustata Schwz., No. 1791. — Crustæ pulveraceæ albæ cinerascenta indeterminatim vagæ effusæ insident. Perithecia sparsa nigra, passim inter se in crusta quasi effiguratim aggregata, nec tamen connexa, intus evacuata, primum convexa subrugosa, demum collapsa. Ascis clavatis, numerosis (·016 mm. long). Sporidiis linearibus obtusis (·004 × ·0015 mm.) minutissimis, hyalinis.

On leaves of *Platanus*. U.S.

The use of reagents failed to detect any septum, but the sporidia were evidently immature and refused to leave the asci.

15*Sphærella (*Læstadia*) faginea Cke. & Plow. in Plow. Sph. Brit. iii., No. 100.—Hypophylla, sparsa, punctiformis. Peritheciis minutis, innatis, tectis, globosis, atris. Ostiolis erumpentibus. Ascis clavatis. Sporidiis biseriatis arcte ellipticis, utrinque obtusis, continuis, hyalinis (·01–·011 × ·0025 mm.)

On beech leaves. King's Lynn.

16*Sphærella (*Læstadia*) Buxi Fckl. Symb. Myc. 100; *Sphæria Buxi*, Desm. Ann. Sci. Nat., xix., 354.—Hypophylla. Peritheciis dense sparsis, minutis, subglobosis, rufo-olivaceis, pallidis in parenchymate folii nidulantibus, epidermide nigrifacta tectis, poro pertusis. Ascis clavatis, medio subinflatis; sporidiis oblongis, obtusis, 1–2 nucleatis, subhyalinis (·01–·011 × ·0035 mm.

On dead leaves of *Buxus*.

Evidently Saccardo regards this as *Microthyrium microscopicum* (see Michelia, vol. i., p. 608), but there is an undoubted *Sphæria* on the specimens published by Desmazieres, and we have collected and examined the same in the fresh state. No one who has done so could possibly confound the two. The *Sphærella* has pale innate

perithecia, covered with a darkened cuticle; the *Microthyrium* has peltate superficial perithecia. A section of the leaf may be cut with a little care, showing the perithecia imbedded in the leaf. Moreover, we have detected no septum in the sporidia. The radiating asci in *Microthyrium* is an arrangement not met with in the *Sphærella*. Hence it is evidently a too hasty assumption that the *Sphæria Buxi* of Desmazieres is *Microthyrium*. In fact, if the cuticle be stripped from the leaf and submitted to the microscope this will be proved.

16******Sphærella** (*Læstadia*) **buxifolia** Cke., sp. n.—Hypophylla. Peritheciis exiguis, 2–4 in cæspitulis minimis congestis, subprominulis, atro-fuscis, poro pertusis. Ascis clavatis. Sporidiis sublanceolatis, utrinque obtusis, continuis, 1–4 nucleatis, hyalinis (·018 × ·004 mm.)

On leaves of *Buxus sempervirens*, var. *Himalensis* from Botanic Garden, Saharunpore, 1865.

This we regarded hitherto as a variety of *Sphæria Buxi*, but further observation disproves this. The perithecia are more prominent, usually two to four together, of a darker colour, nearly black, and the sporidia twice as long, and probably would be uniseptate when fully mätured.

23. Sphærella (*Læstadia*) echinophila (Schwein.), Sphæria echinophila, Schweinitz, N. Amer. Fungi. No. 1755 (1834).—Sporidia ·006 × ·002 mm.

On spines of capsules of *Castanea vesca*. U.S.A.

The name of Schweinitz, as the original author of this species, is omitted, as well as all reference to his description. An original specimen from Schweinitz decides it to be this species, although the measurements vary a little.

28*Sphærella (*Læstadia*) comedens (Schwz.)—This is included by Saccardo in *Apiospora* (No. 2104), but it has no affinity with the other species with which it is associated. The sporidia did not present to us any appearance of an appendiculate base or septnm.

On leaves. Surinam.

29*Sphærella (*Læstadia*) cinerascens Schwz., No. 1795.—Maculis maximis irregulariter et indeterminatim in utraque pagina effusis, colorem cinerascentem in aversa, nigrum in superiori servantibus, aggregata sunt perithecia innumera, minutissima, atra innata, subacuminata, astoma aut demum pertusa, sparsa aut inter se effiguratim juncta. Ascis clavatis. Sporidiis arcte ellipticis, continuis, hyalinis (·008 × 0025 mm.).

On leaves of *Asclepias syriaca*. U.S.

31*Sphærella (*Læstadia*) Magnoliæ Ellis, Bullet., Torr. Bot. Club, ix., p. 74; *Sphæria Magnoliæ* Schwz.—Hypophylla. Peritheciis immersis, plagas latas, griseas aggregatis, vel totâ paginâ inferiori occupantibus. Ascis sublanceolatis. Sporidiis biseriatis clavato-oblongis, hyalinis (·007 × ·0025 mm.).

On fallen leaves of *Magnolia glauca*. U.S.

It is suspected that when fully matured the spores may be uniseptate.

34. Læstadia acetabulum Sacc. Syll.—We have examined the

only original specimen extant and find the asci large and clavate and the sporidia triseptate in a most distinct manner, ·022 × ·005 mm. Therefore it will *not* belong here, but, as we suppose, would be the *Sphærulina acetabulum* of the Paduan system.

35*Sphærella (*Læstadia*) **Melaleucæ** Berk. in Herb. sp. n.—Epiphylla. Maculis orbicularibus, minutis, fuscis, convexis. Perithecciis subinnatis, atris, in maculas congestis. Ascis clavatis. Sporidiis biseriatis, arcte ellipticis, continuis, hyalinis (·008–·01 × ·0025 mm.).

On leaves of *Melaleuca*. New South Wales.

This can hardly be the *Sphæria Melaleucæ* of Leveillé. The perithecia are densely collected on small orbicular brownish spots, which are convex, so that, at first, it resembles a *Dothidea*.

37*Sphærella (*Læstadia*) fœniculacea (Mont.); *Physalospora fœniculacea* Sacc. Syll., No. 1711.—According to specimens from Montagne this is a *Læstadia*, closely allied, and very similar to *L. nebulosa*, if not really the same species. Sporidia ·012–·014 × ·004–·005 mm.

38*Sphæria (*Læstadia*) therophila Desm. Ann. Sci. Nat. xix., p. 116; *Phomatospora therophila* Sacc. Syll., 1652.—Sporidia continuous, ·007 × ·003 mm.

On culms of *Juncus articulatus*.

From the diagnosis itself it is evident enough that this species is misplaced out of *Læstadia*.

39. Læstadia Melastomatum Lev.—Certainly it has no place here. The perithecia are hard and firm, almost like a *Sclerotium*, contents white. Asci cylindrical. Sporidia granular, elliptic, ·018–·02 × ·007 mm. It has more affinity with *Stigmatea*; the perithecia are very prominent and almost superficial.

From original specimen in Herb. Berk., No. 10,245.

40*Sphærella (*Læstadia*) hæmatodes B. & C. in Herb. Berk.—Epiphylla. Maculis orbicularibus, sparsis vel confluentibus, rubro-fuscis, late marginatis. Perithecciis minimis, nigris, semiinnatis, punctiformibus. Ascis cylindrico-clavatis. Sporidiis arcte ellipticis, continuis, hyalinis (·008–·01 × ·0025 mm.).

On *Kalmia glauca*. United States.

Very similar externally to *Sphærella colorata*, but asci and sporidia are little more than half as long, and we fail to distinguish any septum, the sporidia not being sufficiently mature to leave the asci.

41*Sphærella (*Læstadia*) Leucothöes Cke., in Rav. Amer. Fungi, No. 687.—Epiphylla. Maculis albidis, suborbicularis confluentibusve, rubromarginatis. Perithecciis minimis, immersis, ostiolis emergentibus punctiformibus, atris. Ascis clavato-cylindricis. Sporidiis ellipticis, continuis, hyalinis (·013–·015 × ·0045 mm.).

On leaves of *Leucothöe*. Pinopolis, S. Car.

43*Spherella (*Læstadia*) Polygonati Schwz., No. 1793.—Sparsa, perithecciis innatis utrinque prominentibus hemisphericis, astomis, atris, albo-farctis. Ascis subcylindricis. Sporidiis arcte ellipticis, continuis, hyalinis (·008 × ·0025 mm.).

On dead leaves of *Polygonatum*. North America.

54*Sphærella (*Læstadia*) polygonorum Awd.; *Sphærella Polygonorum* Awd., in Unio. Itin. Crypt., 1866.—Peritheciis minutissimis, hypophlæodeis, globosis, nigris, epidermidem mox ostiolo exiguo papillæformi perforantibus. Ascis more generis paraphysibus non obvallatis ovoideis; 8–sporis; sporis 2–3 serialiter stipatis, dactyloideis, hyalinis (ut videtur) integris, rectis vel subcurvulis

On stems of *Polygonum equisetiformis*. Sardinia.

Sporidia straight, ·01–·012 × ·003; evidently young in the specimens distributed, but most probably septate when mature.

55. Was described in 'Grevillea,' vol. v. (1876), p. 102, as *Sphærella cocophylla* Cke. The dark circumscribing line is just of the character found in other specimens of *Sphærella* on leaves, and has no relation to *Diaporthe*.

58*Sphærella (*Læstadia*) Cucurbitacearum (Schwein., No. 1699); *Sphæria cucurbitacearum* Fr. Sys. Myc. ii., 502.—Gregaria. Peritheciis emerso-innatis, hæmisphæricis, lævibus, minutissimis, nitidis, membranaceis, epidermide tectis. Ascis clavatis, abbreviatis, Sporidiis ellipticis, continuis, hyalinis (·0075 × ·003 mm.).

On gourds. U.S.

The sporidia are not mature, but the endochrome is divided, and there is every probability that they are uniseptate when mature; in fact, in some instances they appear to be so now; but this cannot be affirmed positively, although a figure beside the specimens in Herb. Berk. represents the sporidia as uniseptate.

(To be continued.)

ON THE FLORA OF SOUTH BEDFORDSHIRE.

By James Saunders.

About eighty years have elapsed since Abbot's 'Flora Bedfordiensis' was issued, during which time many changes have been effected in the county, both by drainage and agricultural operations. Hence it may be surmised that some interesting plants have been exterminated, and a few agrarian weeds introduced, in addition to which others have been discovered which were then unrecorded. Nor is it a matter for surprise that there are several new county records, since the 'Flora' referred to is essentially that of the Bedford district, and the middle of the county generally. Facilities for locomotion were in those days very limited, hence the "stations" recorded for the extreme south are very few.

It is proposed in the following list, as in Abbot's 'Flora,' that, with the exception of possibly a few ubiquitous forms, having a very high comital census, every record should be based on a voucher specimen, so that in case of doubt reference may be made to it. This will possibly exclude some species that have been noticed, but of which specimens have not been preserved; it is, however, the plan which most commends itself to one's judgment.

The district implied in the term "South Beds" includes the whole of the cretaceous strata, from the upper "chalk-with-flints," and its overlying drift in the extreme south, to the lower green sand at Ampthill, and near Leighton. Within this area the lithological characters of the strata differ greatly, those of the upper beds being calcareous, of the middle chiefly argillaceous, and of the lowest or most northern entirely arenaceous, strongly impregnated with iron. Such plants as are characteristic of any of these zones, will be noted in their places. Within the district the watershed formed by the Chiltern Hills occurs, and it is also characterized by the absence of any large river. The highest elevation is a little over eight hundred feet above the sea level, so that the whole of the area may be regarded as "lowland."

The list, as a whole, will give a fair idea of the plants that are associated with the cretaceous formation as it occurs in England, uninfluenced either by littoral or lacustrine conditions, with the trifling exception of the small "lake" in Luton Hoo Park.

The specimens have all been gathered since 1878.

Clematis Vitalba L.—Abundant on the calcareous beds, in hedges, and borders of thickets.

[*Thalictrum flavum* L., occurs near Bedford, and just over the southern border in Herts, but has not been observed in S. Beds.]

Anemone Pulsatilla L.—Limited to the lower chalk escarpment, where it is locally abundant. Barton; Streatley.

Ranunculus circinatus Sibth.—Rare. Aspley Guise.

R. peltatus Fries.—Local, in ponds, Sundon. Var. *floribundus*.—Pond near King's Wood.

R. Drouetii Schultz.—Local in ponds, Limbury. Var. *Godronii* Gren.—Very rare. Ponds, Limbury. Specimens sent to Botanical Record Club appear to be *Drouetii*, developing floating leaves during very hot summers.

R. Baudotii Godron.—"Reed Pond," Sundon.

R. hederaceus L.—Local. Flitwick; Chorlton.

R. Lingua L.—Very rare. Reed Pond, Sundon. First observed by Mr. J. Ekins.

R. auricomus L.; *R. acris* L.; *R. Flammula* L.; *R. sceleratus* L.; *R. repens* L; *R. bulbosus* L.; *R. arvensis* L.; *R. Ficaria* L.

Caltha palustris L.

Helleborus viridis L.—Local. Limbury, meadows; Whipsnade, woods.

H. fœtidus L.—Occurs abundantly as a garden escape, on the Lynchets, Hart Hill, near Luton.

Aquilegia vulgaris L.—Rare. Barton Leat Wood. Interesting as still existing in Abbot's only station.

[*Delphinium Ajacis* Reich., occurs in corn-fields on calcareous soil at Lilley, Herts, just outside the borders of Beds.]

Berberis vulgaris L.—Local. Woods near Steppingley.

Nymphæa alba L.—In ponds, Woburn Park; probably planted. Abundant in the River Ouse.

Nuphar luteum Sm.—River Lea, in the extreme south.

Papaver Rhœas L.

P. dubium L., var. *Lamottei*.—Common in cornfields.

P. Argemone L.—Local. Pepperstock; Flitwick.

Chelidonium majus L.—Local. Always near houses. Biscot; Stopsley; Heath and Reach.

Corydalis claviculata L.—Local. Clophill Woods; King's Wood.

Fumaria Boræi Jord.; *F. officinalis* L.

F. parviflora Lam.—Rare. Chalky Fields, Barton

Raphanus Raphanistrum L.

Sinapis arvensis L.

Diplotaxis muralis DC.—Probably introduced. Plentiful in 1880, on Midland Railway at Leagrave.

Sisymbrium officinale Scop.; *S. Alliaria* Scop.

Erysimum cheiranthoides L.—Locally abundant near water. Greenfield; by the Lea, south of Luton.

Hesperis matronalis L.—Woods, Luton Hoo Park; probably planted.

Cardamine pratensis L.; *C. hirsuta* L.

Arabis thaliana L.—Common in cultivated fields.

Barbarea vulgaris Br.—Water-side, Luton; Flitwick.

Nasturtium officinale Br.

N. sylvestre Br.—Rare. Deodorizing Works, Luton.

N. palustre DC.—Local. Damp woods, south-east of Luton.

N. amphibium Br.—Rare. Banks of the River Lea, near Mill End.

Draba verna L.

Camelina sativa L.—Casual. Deodorizing Works, Luton, 1879.

Thlaspi arvense L.—Only observed as a casual, Deodorizing Works, Luton.

Iberis amara L.—Locally abundant. Chalky fields, and near rabbit-holes on the lower chalk escarpment.

Capsella Bursa-pastoris Mœnch.

Lepidium campestre Br.—Local. Sundon.

Reseda lutea L.—In fields, on railway banks and waste places. Generally distributed over the chalk district.

R. Luteola L.—More local than the preceding. Abundant on the lower chalk escarpment.

Helianthemum vulgare Gaert.—Common on dry grassy banks, especially on the chalk.

Viola palustris L.—Rare. Flitwick Marsh, about two miles from Abbot's station, "Ampthill," where it is probably extinct.

V. odorata L.

V. hirta L.—Abundant over the chalk area, especially on the lower chalk escarpment. A variety, with elongated root-stocks, is abundant in woods south-east from Luton, and under beech trees by the New Mill End road.

V. sylvatica Fr., *a. Riviniana*.—More common than *β. Reichenbachiana*.

V. canina L.—Local on sandy soil. Heath and Reach; Chiltern Green Common.

V. tricolor L.—Fields on the Barton Hills. Var. *β. arvensis*. —Common.

Drosera rotundifolia L.—Very rare. Flitwick Marsh.

[*D. longifolia** and *D. anglica* are both given by Abbot, at "Ampthill Bogs," but they are probably extinct.]

Polygala vulgaris L.

Saponaria officinalis L.—An escape on the Midland Railway, Harlington.

Silene inflata Sm.

S. noctiflora L.—Rare. Barton Hills. (Oakley West Field, Abbot).

Lychnis vespertina Sibth.; *L. diurna* Sibth.; *L. Floscuculi*, L.; *L. Githago* Lam.

Arenaria serpyllifolia L.—Walls. *β. leptoclados*.—Fallow fields, Limbury.

Cerastium semidecandrum L.; *C. glomeratum* Thuill.; *C. triviale* L.

C. arvense L.—Local. Fields near Warden Hills.

Stellaria aquatica Scop.—Local. "Marslets," Luton; near New Mill End, Flitwick.

S. media With.; *S. graminea* L.; *S. Holostea* L.

S. glauca With.—Rare. Woods, Luton Hoo Park, Mr. J. Ekins, Aug. 1879.

S. uliginosa Murr.—Local. "Marslets," Luton; Flitwick Marsh.

Sagina ciliata Fr.; *S. procumbens* L.

S. nodosa Meyer.—Rare. Leagrave Marsh.

Spergula arvensis L.

Spergularia rubra Fenzl.—Flitwick. Only observed on the lower green sand.

Scleranthus annuus L.

Montia fontana L.—Wet places. Rare. Ampthill Moor; Potton Marshes, "Abbot." Not observed recently.

Claytonia perfoliata Don.—Abundant and well established on the lower green sand between Ampthill and Maulden.

Hypericum perforatum L.; *H. tetrapterum* Fr.; *H. pulchrum* L.

H. humifusum L.—Local. Chiltern Green.

H. hirsutum L.—Local. Biscot.

H. Elodes L.—Rare. "Potton Marshes," Abbot. Potton Marshes are now drained, hence it is probably extinct.

Malva moschata L.; *M. sylvestris* L.

M. rotundifolia L.—Local. Most abundant on the lower green sand, Ampthill, Woburn, &c.

Linum catharticum Sm.

Geranium pratense L.—Locally abundant. Nether Crawley; Limbury; Totternhoe.

G. pyrenaicum L.—Occurs at Cold Harbour, Herts, just over the county boundary, and also near Bedford.

G. molle L.; *G. dissectum* L.; *G. Robertianum* L.

G. lucidum L.—Local. "Marslets," near Luton.

Erodium cicutarium L'Herit.

Oxalis Acetosella L.

Ilex Aquifolium L.—Abundant in hedges.

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* There is no specimen in Abbot's Herbarium. See Mr. Pryor's paper in 'Journ. Bot.,' 1881, p. 44.

Euonymus europæus L.—Abundant in hedges, especially by old bridle-paths, and in thickets; often planted in these.

Rhamnus catharticus L.—Abundant in the chalk district; rare or absent elsewhere.

R. Frangula L.—Rare. Aspley Wood. Only observed on the green sand.

Acer campestre L.

Ulex europæus L.—Common in sandy soils.

Genista anglica L.—"Ampthill Heath," Abbot.

Sarothamnus scoparius Koch.—Only on sandy soils. Rare in the extreme south of the county. Abundant at Flitwick.

Ononis spinosa L.—Abundant; especially on the chalk escarpment.

O. arvensis L.—Common.

Anthyllis Vulneraria L.—Locally abundant on chalk hills.

Medicago lupulina L.

Melilotus officinalis Willd.—Common on railway banks and in cultivated fields.

M. arvensis Wallr.—Rare. Near the Warden Hills.

Trifolium pratense L.; *T. arvense* L.; *T. hybridum* L. (Rare. New Mill End); *T. repens* L.; *T. procumbens* L.; *T. minus* Relhan.

Lotus corniculatus L.

L. major Scop.—Local. Limbury Marsh; Flitwick Marsh.

[*Astragalus glycyphyllus* L.—Rare. Not observed in the south of the county. "Bromham, Oakley;" Abbot. Turvey; Miss Higgins, 1880].

Ornithopus perpusillus L.—Locally abundant, but only observed on sandy soil. Heath and Reach; Ampthill.

Onobrychis sativa Lam.—Not uncommon on dry grassy banks. Apparently indigenous on the ancient greensward of the Chiltern Hills.

Vicia hirsuta Koch; *V. tetrasperma* Mœnch; *V. Cracca* L.; *V. sepium* L.

V. angustifolia Roth.—Great Northern Railway banks, south of Luton.

Lathyrus Aphaca L., and *L. Nissolia* L.—Only observed as "casuals" at the Deodorizing Works, Luton.

L. pratensis L.

Orobus tuberosus L.—Local. King's Wood.

(To be continued.)

ON THE FLORA OF INNISHOWEN, CO. DONEGAL.

By H. C. Hart, B.A.

(Continued from p. 47).

Innishowen is well situated for studying the distribution of plants in the extreme north of Ireland. With this object in view I shall enumerate those species which increase westwards, contrasting them with those which become scarcer. Characteristic or

tolerably frequent species only are taken into account. The district of Fanet, which is frequently mentioned, lies west of Lough Swilly, between it and Mulroy. In latitude it lies immediately south of Malin, to which it is quite similar in physical features. With its botany I am especially familiar, and an account of it has been already given in this Journal. The following species become more prevalent west of Lough Swilly; those with E attached belong to Watson's English type:—

Nymphæa alba.—More frequent in Fanet and westwards.

Drosera anglica.—Abundant from Kilmacrennan to Gweedore, and in the Rosses.

Radiola Millegrana.—Much commoner in Fanet, and westwards in many places.

Sedum Rhodiola. — Increases westwards steadily, attaining a maximum in Aranmore.

Saxifraga stellaris.—Very scarce in Innishowen, but quite frequent about Muckish, Errigal, &c.

S. umbrosa.—Malin is the eastern limit in Ireland of this plant; common on Errigal, Muckish, Slieve Snacht West, and in the West of Ireland generally.

Eryngium maritimum.—Commoner in Fanet.

Crithmum maritimum.—A scarce plant in Donegal, but it is plentiful at one place in Rossgull, and at Hornhead.

Bidens tripartita E; *B. cernua* E. — Increase in frequency westwards apparently, but both are local.

Carduus pratensis E; *Achillea Ptarmica.*—More abundant and characteristic westwards, the thistle especially so; it is rather scarce in Innishowen.

Lobelia Dortmanna; Utricularia minor.—More plentiful in lakes and bog-holes westwards, as about Muckish, Glenveagh, and Errigal.

Arctostaphylos Uva-ursi. — More abundant about Crohy Head and Aranmore than elsewhere.

Pyrola media; Beta maritima; Euphorbia portlandica.—These three are all more frequent in Fanet than Innishowen. *Beta* increases westwards from Malin Head, especially on headlands and outer cliffs.

Polygonum Hydropiper.—Much commoner in Fanet.

Littorella lacustris. — Becomes very abundant westwards, and fringes all mountain lakes at moderate altitudes.

Habenaria viridis.—Very frequent in Fanet.

Juniperus nana.—Increases westwards; characteristic in Fanet; profusely abundant on Aranmore.

Sparganium natans.—Commoner in bog-holes and lakes from Ramelton to Fanet than elsewhere.

S. minimum; Schœnus nigricans; Rhynchospora alba; Molinia cærulea.—More prevalent throughout the north-western moorlands. *Sparganium* occurs in almost every lake westward.

Asplenium marinum.—Much more abundant on the rocky coast of Fanet than Innishowen.

Osmunda regalis.—Very rare in Innishowen; becomes at once common and characteristic upon crossing Lough Swilly.

Hymenophyllum Wilsoni.—Increases steadily westwards; very abundant about Glenvegh, Slieve Snacht West, &c.

The above list only includes plants fonnd in Innishowen, but to give a full idea of this subject I will mention a few characteristic or locally frequent species of Donegal which do not appear in Innishowen; these are—

Trollius europæus.
Centunculus minimus, E.
Eriocaulon septangulare.
Polypodium Phegopteris.
Hymenophyllum Tunbrigense.

None of these have yet been found in Innishowen; *Centunculus* is likely to occur.

The above group of plants illustrates one fact: that the climate increases in humidity westwards. Innishowen is drier and probably also colder than the western parts of the county. The increasing variety and plenty of ferns show this, and others in the list are plants which are as much dependent upon the damp atmosphere for their leaves as damp soil for their roots. The influence of the Gulf Stream is thus displayed, and especially in its rendering the winter milder to the west.

The species next enumerated diminish or disappear altogether after we cross Lough Swilly. Rare plants are not taken into consideration:—

‡*Papaver dubium*. — Much scarcer in Fanet and westwards; a rare colonist.

Nuphar lutea E.—Scarcer in the west.

‡*Barbarea vulgaris* E.—A rare colonist in North Donegal.

†*Sisymbrium officinale*. — Perhaps a colonist in Innishowen; almost certainly so in Fanet and farther west.

Capsella Bursa-pastoris. — Decreases steadily, and probably a colonist far west.

**Senebiera Coronopus* E.—Not met with west of Innishowen; not native in Donegal.

‡*Reseda Luteola*; *Silene anglica* E. — Not met with west of Innishowen; both are probably introduced weeds.

†*S. inflata* E.—Not met with in the extreme north-west.

Sarothamnus scoparius —Scarce; rarer westwards, and not seen west of Mulroy.

Ulex europæus.—Not native in the extreme north-west.

Trifolium pratense. — Probably not native in North-west Donegal.

T. medium. — Very scarce, but occurring to the extreme north-west; a characteristic species of Innishowen.

T. arvense E.—Not met with west of Innishowen.

Lotus major.—Very rare westward.

Vicia hirsuta. — Characteristic in Innishowen; much scarcer in Fanet, and not seen west of it.

V. angustifolia.—Not seen west of Innishowen.

Lathyrus pratensis.—Not seen in the extreme west.

Geum urbanum.—Scarce west of Dunfanaghy.

Epilobium parviflorum.—Very rare, and soon disappears west of Lough Swilly.

Epilobium hirsutum.—Very rare west of Innishowen.

Ligusticum scoticum. — This species reaches a maximum in Innishowen; its western limit is Tory Island.

Torilis Anthriscus.—Not seen west of Carrigart.

Petasites vulgaris E.—Not seen in the north-west, and probably not native west of Innishowen.

Lycopsis arvensis. — Very rare in Fanet, and not seen west of it.

Mertensia maritima. — I have seen this in one locality, on Rossgull, west of Innishowen.

Scrophularia aquatica E.—Diminishes westwards. I have no certain record west of Ramullan.

Utricularia vulgaris.—Very scarce westwards.

Potamogeton pectinatus.—Not seen west of Innishowen.

Carex remota; Melica uniflora E; *Sclerochloa loliacea* E; *Festuca arundinacea*, E. — None of these were met with in the extreme north-west.

Equisetum maximum E. — Not seen in North Donegal west of Glenvar, on the west side of Lough Swilly.

Lycopodium clavatum.—Not seen west of Innishowen.

Several of the above, and some others which might be adduced, are introduced plants or weeds of cultivation, which naturally decrease in the wilder parts of the county. About half the decreasing species belong to the English type or are "inclining to English," the remainder being mostly British species which probably require more sun and less rain than Western Donegal can afford. Plants belonging to the English type almost all decrease northwards and westwards. There will be found three or four exceptions to this in the increasing list, *Carduus pratensis* being the only notable one. Highland, Northern, and Atlantic species all increase in the western parts of the county, both in number and profusion, the Atlantic type only slightly so. Speaking generally of the larger families, *Umbelliferæ* and *Carices* seem to fail most in Donegal, both in quantity and kind.

In contrasting the flora east and west of Lough Foyle, there is little more to be said than that the variety of species as we pass east steadily increases. I am not going to enter into this contrast in detail, since it concerns the county Derry; but, crossing from Innishowen Head to Magilligan Strand and then ascending Ben Evenagh, I at once found several species not met with in Northern Donegal, as *Ranunculus Lingua*, *Alsine verna*, *Dryas octopetala*, and *Hordeum murinum; Scilla verna* is also found there; and I noticed that others which have barely found their way across Lough Foyle are abundant on its eastern side, as *Trifolium arvense* and *Silene anglica;* while colonists, weeds of cultivation, and species of Watson's English type of distribution become more prevalent.

With regard to Highland plants, Innishowen enters into closer competition with the mountains eastward, three species occurring which are unknown in the north-east of Ireland. These are *Saussurea alpina*, *Polygonum viviparum*, and *Carex rigida*. The alpine flora of Innishowen is almost equal to that of Derry, Antrim and Down together, so far as they are yet made known, although these counties contain several mountain groups and the highest summits in the north of Ireland. When we consider the size of Innishowen, this is equivalent to a decided increase. The alpine flora of Donegal is superior to that of the north-east district in about the proportion of three to two. The alpine flora of Ireland is best developed in the mountains of Sligo and Leitrim, diminishing northwards in Donegal, slightly more so in Galway and Mayo, and still more so in Kerry, although the highest Irish mountains occur there.

Northern and Atlantic species would perhaps have been expected to increase in the more western and northern districts, but this is by no means the case. Excepting two, *Trollius europæus* and *Potamogeton filiformis*, which have not been found in Innishowen, all the northern species occurring in Donegal and many more are found in the north-east, where this group is best developed in Ireland.

With regard to Atlantic or Western plants, this type is poorly represented in the north of Ireland; it is, moreover, quite unexpected to find a greater variety in the north-eastern than in the north-western counties. Innishowen contains two species not found in the north-east, viz., *Orobanche Hederæ* and *Bartsia viscosa;* while two others, *Statice occidentalis* and *Adiantum Capillus-veneris*, each occur in a single locality in the west of Donegal. In opposition to this there are, according to the 'Cybele Hibernica,' eight Atlantic species in the north-east district which I have not found in Donegal. This group of plants increases southwards on both coasts of Ireland, but more rapidly on the east; and attains its maximum, I believe, in the south-east corner of Ireland.

In conclusion, the flora of Innishowen will be found to contain slightly above five hundred species; about half the Irish flora, and five-sixths of the flora of Donegal. Thirty species at least occurring in Innishowen do not appear to occur elsewhere in Donegal. The area of Innishowen is about one-fifth of that of the whole county. The extreme northern part of Innishowen,—the district of Malin, lying north of Culdaff and Malin estuaries—is a well-defined peninsula, rising north of a low neck of land, at once, to a low mountainous country and from the most northern point of Ireland. A rise in the sea-level of about four or five feet would connect Culdaff estuary on the east with Malin estuary on the west, and transform Malin to an island. There is little cultivation on Malin; it is chiefly moorland or devoted to sheep pasture, and is quite similar in physical features to its western neighbour Fanet. Malin is oval in shape, its greater axis, from Culdaff to Malin Head, being twelve miles in length, and lying north-west and south-east, while its lesser axis is about five miles. Its greatest elevation is

about 859 feet, insufficient, apparently, to harbour any of the truly alpine species found a few miles southwards. Its area is not much less than that of Fanet, but its flora is much scantier. I was unable to visit Innishtrahull, but Dr. Dickie has recorded the finding of 44 species thereon, none of which appear to be of particular interest, except perhaps a remarkable variety of *Euphrasia officinalis*. Some curious forms of this and other plants occur also about Malin Head. *Euphrasia* sometimes occurs with long spikes, whose leaves are fleshy and densely packed along the stem, and the flowers large; another variety has no stem, but forms an hemispherical body of white flowers, lying on the ground like a little snowball about two or three inches across, perhaps due to continually being browsed on by sheep. *Teucrium Scorodonia* becomes fleshy, with wrinkled reflexed oblong leaves, quite a queer-looking plant. *Triodia decumbens* grows in prostrate patches, its stem about three inches long. *Plantago lanceolata* has thick leaves which almost conceal their ribs, and become so narrow as almost to equal in width and resemble those of wide-leaved alpine forms of *Plantago maritima*, which also occur. *Lastrea Filix-mas* is very stunted and shaggy, equivalent to alpine var. *abbreviata;* and *Kœleria* grows on the west side, from two to three inches in height, and is almost unrecognizable. On the other hand, *Asplenium marinum*, *Sedum Rhodiola*, and *Ligusticum scoticum* attain great perfection; *Mertensia maritima* is more luxuriant than I have seen it, except in Greenland, and *Honckenya peploides* had to be looked at in the hand before it could be identified. I have described it in its proper place. The soil at the extremity of Malin Head is a carpet of stunted *Sedum anglicum*, *Plantago maritima*, *P. Coronopus*, and *Armeria maritima*, grass there being scanty. A few species increase northwards, and are more plentiful in this district than elsewhere in Innishowen. These are—

Vicia hirsuta.	Stachys arvensis.
Radiola Millegrana.	Armeria vulgaris.
Sedum Rhodiola.	Plantago maritima.
S. anglicum.	P. Coronopus.
Crithmum maritimum.	Beta maritima.
Ligusticum scoticum.	Eleocharis multicaulis.
Myosotis cæspitosa.	Asplenium marinum.
Mertensia maritima.	

A SYNOPSIS OF THE GENUS *SELAGINELLA*.

By J. G. Baker, F.R.S., &c.

(Continued from p. 46.)

17. S. Barklyi Baker Fl. Maur. 522.—Stems densely tufted, decumbent, not more than an inch long, copiously compound. Leaves of the lower plane crowded, spreading, flat, oblong, obtuse, ½ lin. long, firm in texture, minutely ciliate-denticulate, nearly

equal-sided, rounded on both sides at the base ; leaves of the lower plane a third as long, obovate, cuspidate, much imbricated. Spikes $\frac{1}{8}$–$\frac{1}{4}$ in. long, $\frac{1}{2}$ lin. diam., square ; bracts deltoid-cuspidate, crowded, strongly keeled.

Hab. Round Island, off the coast of Mauritius, *Sir H. Barkly !* A near ally of *S. obtusa*.

18. S. OBTUSA Spring Mon. ii. 200 ; *S. viridula* and *pusilla*, Spring ; *Lycopodium obtusum* Desv. ; *L. pusillum* Desv. ; *L. viridulum* Bory ; *L. umbrosum* Willd. — Stems trailing, pale, square, with an angled face, 2–4 in. long, copiously pinnately branched, the branches short, the lower deltoid, copiously compound. Leaves of the lower plane close, spreading, ovate-deltoid, $\frac{3}{4}$–1 lin. long, bright green, obtuse, moderately firm in texture, flat, very unequal-sided, minutely ciliate-denticulate, broadly rounded on the upper side at the base and much imbricated over the stem, cuneate-truncate on the lower side ; leaves of the lower plane a third as long, obovate, with a cusp nearly as long as the blade. Spikes square, $\frac{1}{4}$–$\frac{1}{3}$ in. long, $\frac{1}{2}$ lin. diam. ; bracts deltoid-cuspidate, crowded, acutely keeled.

Hab. Mountain rocks of Mauritius, Bourbon, and Madagascar.

18.***S. Mittenii**, n. sp. — Stems densely intermatted, trailing, $1\frac{1}{2}$–2 in. long, tripinnate, with several erecto-patent main branches. Leaves bright green, moderately firm in texture, those of the lower plane cordate-ovate, subacute, 1-12th in. long, strongly denticulate all down the upper margin, with a central midrib, contiguous or rather imbricated on the branchlets ; leaves of the upper plane a third as long, oblique ovate, acute. Spikes copious, 4-angled, not more than $\frac{1}{6}$ in. long ; bracts ovate-lanceolate, much imbricated, $\frac{1}{2}$ lin. long, strongly keeled, conspicuously denticulate on the margins.

Hab. Usassura Mountains, Central Africa. Just received from Mr. Mitten.

19. S. BALFOURII Baker Fl. Maur. 522.—Stem trailing, densely matted, 3–4 in. long, forked low down, distantly pinnate, with short copiously compound lower branches. Leaves of lower plane spaced, except at the tips of the branchlets, patent, oblong, obtuse, $\frac{1}{2}$–$\frac{3}{4}$ lin. long, entire, not ciliated, flat, rather rigid in texture, pale green, the lower edge parallel with the midrib, the upper convex and broadly rounded at the base ; leaves of the upper plane a third as long, obovate-cuspidate, much imbricated, strongly keeled throughout. Spikes $\frac{1}{4}$—$\frac{1}{2}$ in. long, square, $\frac{1}{2}$ lin. diam. ; bracts orbicular-cuspidate, crowded, strongly keeled, not much longer than the sporangia.

Hab. Rodriguez, on the coralline limestone, *Dr. I. B. Balfour !* A near ally of *S. obtusa*.

20. **S. Welwitschii**, n. sp. — Stems densely matted, trailing, 2–3 in. long, distantly pinnately branched, the lower branches slightly compound. Leaves of the lower plane crowded on the branches, ascending, ovate, acute, slightly unequal-sided, $\frac{1}{2}$ lin. long, incurved, moderately firm in texture, ciliate-denticulate on all the margins, cordate and more strongly ciliated on the upper

side at the base, rounded on the lower side; midrib distinct from base to tip; leaves of the upper plane a third as long, ascending, imbricated, ovate, acute. Spikes unknown.

Hab. Angola, on dry rocks of the Pedras of Pungo Andongo, *Welwitsch*, 43! A close ally of *S. raginata*.

21. **S. somaliensis**, n. sp.—Stems wiry, wide-trailing, terete, ½–1 ft. long, dichotomously forked, the forks copiously pinnate, the short distant branches copiously flabellately compound. Leaves of the lower plane crowded on the branchlets, patent, ovate-lanceolate, ½ lin. long, subacute or subobtuse, flat, not incurved, moderately firm in texture, not very unequal-sided, the midrib distinct, both sides, especially the upper, furnished with conspicuous unequal cilia, the upper side broadly rounded at the base and much imbricated over the rachis; leaves of the upper plane half as long, ovate, acute, cuspidate, much imbricated. Spikes unknown.

Hab. Mountains of Somali-land, 1500–6000 ft., *Hildebrandt* 1484! A near ally of *S. mongholica* and *yemensis*.

22. S. CATHEDRIFOLIA Spring, Mon. ii. 112.—Stems slender, trailing, pale, flat on the face, reaching a length of ½–1 ft., copiously pinnately branched, with copiously compound short branches. Leaves of the lower plane close, spreading, ovate, acute, ¾–1 lin. long, bright green, flat, not very firm in texture, broadly rounded and strongly ciliated on the upper side at the base; leaves of the upper plane ⅓ as long, much imbricated, ovate, with a long cusp. Spikes square, ¼–⅓ in. long, ¾ lin. diam.; bracts crowded, ovate-lanceolate, acute, strongly keeled.

Hab. Upper Guinea at Princes Island, Fernando Po, Old Calabar, &c. Var. *minor* A. Br., gathered by Welwitsch in Angola on the hills of Pungo Andongo, differs by its shorter much less compound stems. A near ally of *S. ornithopodioides*.

23. **S. arenaria**, n. sp.—Stems filiform, intermatted, very slender, trailing, angled on the face, 1–2 in. long, the ascending pinnately-arranged branches simple or forked. Leaves of the lower plane ascending and contiguous both on the main stem and branches, oblique broad ovate, acute, ½ lin. long, bright green, moderately firm in texture, more produced on the upper side of the midrib, cordate and ciliated on the upper side at the base and imbricated over the stem; leaves of the upper plane ⅓ as long, oblique ovate, acute, much imbricated. Spikes short, square, ½ lin. diam.; bracts ovate cuspidate, strongly keeled.

Hab. Cataract of Panuré, on the Rio Uapes, in sandy places, liable to inundation, *Spruce* 2861!

24. **S. valdepilosa**, n. sp.—Stems slender, trailing, densely intermatted, 2–3 in. long, with several ascending irregular simple or slightly compound branches. Leaves of the lower plane spaced on the main stem, contiguous on the branches, ovate, acute, firm in texture, erecto-patent, subequilateral, ½ line long, conspicuously ciliated up to the apex, especially on the anterior border; leaves of the upper plane ⅓ as long, oblique ovate, slightly imbricated. Spikes short, square, ¾ lin. diam.; bracts ovate-lanceolate, suberect.

Hab. Demerara; ravine near the Haieteur Savanna, *Jenman* 1484!

25. **S. tuberculata** Spruce MSS.—Stems densely intermatted, trailing, filiform, ½–1 in. long, with a few spreading simple pinnately-arranged branches. Leaves of the lower plane ascending, the upper contiguous, the lower slightly spaced, ovate-oblong, quite obtuse, not more than ¼ lin. long, bright green, moderately firm in texture, concave on the face, the midrib not reaching the tip, nearly equal-sided, the upper side cordate and distinctly ciliated at the base and imbricated over the stem; leaves of the upper plane ½ as long, oblique ovate, acute, not cuspidate, much imbricated. Spikes not seen.

Hab. Rocks at the Panuré Falls, on the Rio Uapes, *Spruce* 2940! A very distinct and beautiful little species.

26. **S. brevifolia,** n. sp.—Stems slender, trailing, 1½–2 in. long, much intermatted, closely pinnate, the branches regularly erecto-patent, the lower considerably compound. Leaves of the lower plane crowded down to the base of the main stem, erecto-patent, oblique ovate, acute, not more than ¼ lin. long, bright green, firm and rather rigid in texture, much dilated on the upper side of the midrib, nearly as broad as long, strongly ciliated and much imbricated over the stem on the upper side at the base; leaves of the upper plane ½ as long, oblique ovate, much imbricated, shortly cuspidate. Spikes sharply square, ⅓ lin. diam.; bracts ovate, acute, strongly keeled.

Hab. Rio Negro, on rocks by the Janaraté cachoeira, forming large patches, *Spruce* 2547!

27. **S. brevicaulis,** n. sp.—Stems densely tufted, procumbent, ½-1 in. long, copiously branched. Leaves of the lower plane crowded, much imbricated, erecto-patent, linear-oblong, obtuse, ½ lin. long, green, moderately firm in texture, the midrib distinct and central, both sides conspicuously ciliated, the upper broadly rounded at the base and much imbricated over the rachis; leaves of the upper plane oblique ovate, acute, a third as long, much imbricated. Spikes very short, square, ½ lin. diam.; bracts ovate, acute, strongly keeled.

Hab. Eastern Cuba, near Monte Verde, *C. Wright* 941!

28. S. MICROPHYLLA Spring Monog. ii. 88; *S. thuyæfolia* Spring; *Lycopodium microphyllum* H. B. K.—Stems densely matted, trailing, 2–3 in. long, copiously pinnately branched, the lower branches copiously compound. Leaves scarcely dimorphous, those of the lower plane erecto-patent or adpressed to the stem, ovate, acute, ¼ lin. long, dark green, firm in texture, nearly equal-sided, cordate on both sides at the base, ciliated on both margins, the midrib obscure; leaves of the upper plane scarcely smaller, oblong, cuspidate, distinctly nerved, ascending, imbricated. Spikes ⅙–⅓ in. long, square, ½ lin. diam.; bracts crowded, ovate-cuspidate, strongly keeled.

Hab. Tropical America on mountain rocks; Guatemala, *Bernouilli* 955! New Granada, *Moritz* 369! *Lindig* 1519! Ecuador *Spruce* 4787! Brazil, *Lindberg* 682! *Glaziou* 7967! Cordoba,

Hieronymus! A near ally of *S. sanguinolenta*. I cannot help thinking that *S. Swartzii* Spring Mon. ii. 89, is this species, and the locality "India orientalis" a mistake.

29. S. TENUISSIMA Fée Fil. Bras. Suppl. 98 t. 108, fig. 1.—Stems densely matted, trailing, 3–6 in. long, very slender, pale, angled on the face, forked, distantly pinnately branched, the branches little compound. Leaves of the lower plane decidedly spaced, spreading, pale green, rather rigid in texture, oblique oblong, subobtuse, ½ lin. long, much more produced on the upper side of the distinct midrib, rounded and shortly ciliated at the base on the upper side, not imbricated over the stem; leaves of the upper plane half as long, oblong, with a long cusp, but little imbricated. Spikes very short, nearly as broad as the leafy branches; bracts ovate cuspidate, strongly keeled.

Hab. Mountains near Rio Janeiro, *Glaziou* 4484! 4486! 4499! *S. serpens* Fée Fil. Bras., Suppl. 99, is a form of this and totally different from Spring's West Indian plant.

30. S. LINDENII Spring Monog. ii. 118.—Stems trailing, very slender, 3–6 in. long, subterete, pinnately branched, the branches short and but slightly compound. Leaves of the lower plane oblong-lanceolate, obtuse, crowded, spreading, ¾–1 lin. long, bright green, moderately firm in texture, more produced on the upper side of the distinct midrib, ciliated on the upper margin of the lower half, produced at the base on the upper side, and so much imbricated over the branch that it is quite hidden; leaves of the upper plane very small, ovate, acute, quite erect. Spikes very short, square; bracts ovate-lanceolate.

Hab. In Mexico near Teapa, *Linden*! Like *S. jungermannioides* on a small scale.

31. S. DELICATISSIMA A. Br. in Ann. Sc. Nat. ser. 4, vol. 13, p. 60.—Stems densely matted, very slender, stramineous, trailing to a length of 6–12 in., forked and copiously pinnately branched, the branches copiously compound. Leaves of the lower plane spaced except at the tip of the branches, patent, oblong, obtuse, moderately firm in texture, more produced on the upper side of the distinct midrib, broadly rounded and densely ciliated on the upper side at the base; leaves of the upper plane ½ as long, oblong, acute, strongly auricled on the outer side at the base. Spikes unknown.

Hab. Frequent in cultivation, the native country not known, but probably Andine. Introduced by Linden. The leaves and tips of the branches curl up readily in drought.

(To be continued.)

SHORT NOTES.

THE NORTH LINCOLN LYCOPODIUM.—Twenty-six years ago, and for a year or two later, a *Lycopodium*—presumably *alpinum*—grew on the boggy lias-shale slope above Coneysby pits, on Crossby

Warren, near Frodingham; and a publication of the fact was given at p. 134 of the 'Botanical Record Club Report' for 1875, after an examination of a Mr. E. Coates's specimens—one in fruiting state; the other a creeping, barren branch. The stratum upon which they grew, and the general conditions of the site, being very similar to those of the West Gloucester *L. complanatum*, Mr. Druce suggested that the Lincoln plant had in reality been *complanatum* also. Thinking it might possibly be so, I have procured the loan of what are, I believe, the only specimens now in existence of this extinct Lincolnshire species. They were gathered in 1857, by Messrs. W. Fowler and E. Coates, at a spot where ironworks now stand; and they are, as you may see, undoubtedly typical *alpinum*, not even showing that approach to a complanate arrangement of the leaves which is presented by Mr. Druce's intermediates gathered in West Ross and South Aberdeen. His Glydyr Fawr specimens seem to me much nearer Father Reader's Gloucestershire ones. A similar intermediate form grows on Ingleborough, in West Yorkshire, the approach to *complanatum* being most evident whilst the plant is young and barren, and spreads fan-like upon the ground; but I should call none of these true *complanatum*, nor indeed expect that to occur at all in our more alpine stations, since even in the United States the typical plant has a tendency to southern restriction, and in Canada and the North becomes *sabinæfolium* Willd.—F. Arnold Lees. [The specimens sent are certainly *L. alpinum*.—Ed. Journ. Bot.].

Utricularia neglecta Lehm. in Middlesex.—Messrs. C. Chantre, J. R. Jackson, and myself, found this species in considerable quantity, in the autumn of 1881, in several large ponds near the railway-station between Staines and Wraysbury. At first I was in doubt whether to credit Bucks or Middlesex with the new record, but a reference to the railway authorities settled the matter in favour of the latter county. In the first place it is better to state that Professor Babington, who kindly examined my plant, has confirmed the name. The figure in 'English Botany,' iii., tab. 1125 *bis*, is a bad one; the foliage, as represented there, gives no idea of the foliage of the living plant, and the form of the lip too is quite unlike that in the fresh flower—indeed, the only character fairly rendered seems to be that supplied by the length of the pedicels and their position. The figure in 'Flora Danica,' 12, tab. 1981, is much more satisfactory. There seems a pretty general belief amongst British botanists that *U. neglecta* is a small plant; the Middlesex one is, however, almost as large as *U. vulgaris*. The lip is described in Babington's Manual has a broad flat spreading margin, and one character not mentioned in that work I particularly observed in the fresh state, *viz.*, the veining of the palate. In Brébisson's 'Flore de la Normandie,' ed. 5. p. 306, the italicized portions of the descriptions of *U. vulgaris*, and *U. neglecta* are as follow: The first named has "Fleurs d'un jaune clair . . . palais marqué d'un petit nombre de lignes on taches d'un rouge pâle, non anastomosées": the latter, "Fleurs d'un jaune-orangé . . . . palais

strié de lignes nombreuses, anastomosées, d'un rouge vif." All the ponds in which *U. neglecta* was observed are in District II of Trimen and Dyer's 'Flora of Middlesex,' which work, moreover, contains no recent record of any *Utricularia*; the first record of *U. vulgaris*, Districts III and VII, being about 1750, and last 1778, whilst *minor* is given for Districts I and III; first record 1700, last 1774.—GEORGE NICHOLSON.

ALIENS IN GLOUCESTERSHIRE.—There is a spot in the parish of Kingswood, Gloucestershire, about four miles north-east of Bristol, which deserves mention on account of the extensive collection of alien plants known to have existed there for some years. It is a small heap of shaly *débris* (about 50 yards by 25) on the slope of a low hill, and surrounded by cornfields. This heap may have been the result of an old trial-boring for coal, but at present there is no pit or working in the near vicinity; and enquiries show that the place has remained undisturbed for about twenty years. Last summer a friend and I made several visits to the place, and gathered the plants whose names are appended. We cannot learn the means whereby they were imported;—probably with foreign corn or fodder. They are all alien to the Kingswood district, and, with few exceptions, to that of the Bristol coal-fields. *Delphinium Ajacis*, *Glaucium phœniceum*, *Camelina sativa*, *Erysimum orientale*, *Reseda lutea*, *Saponaria Vaccaria*, *Silene dichotoma*, *S. noctiflora*, *Dianthus prolifer*, *Gypsophila muralis*, *Trifolium supinum*, *T. arvense*, *Melilotus officinalis*, *M. alba*, *Medicago sativa*, *M. falcata*, *Potentilla argentea*, *Bupleurum rotundifolium*, *Anthemis tinctoria*, *Grindelia squarrosa*, *Achillea nobilis*, *Centaurea Cyanus*, *C. paniculata*, *C. melitensis*, *Gilia capitata*, *Stachys annua*, *Salvia sylvestris*, *Satureia hortensis*, *Echinospermum Lappula*, *Echium vulgare*, *Verbascum virgatum*, *Plantago arenaria*, *Apera Spica-venti*, *Festuca Myurus*, *Bromus arvensis*.—JAS. W. WHITE.

BOTANICAL NOMENCLATURE.

[The following note was communicated by Baron von Mueller to the Melbourne 'Chemist and Druggist' for September, 1882, and seems to us of sufficient interest to deserve wider circulation.]

AT first sight it may seem unimportant to devote close attention to the synonymy of plants; but it should be considered that unless phytographic authors came to permanent agreement about nomenclature, we would have to burden our memory with a multiplicity of names, much against facility and acceleration of our studies. To effect conformity of opinion on names in biomorphic science, whether phytological or zoological, the only rule to settle disputes is that of *absolute priority*; and that rule ought to be subject to no exceptions, unless the original names were untenable through generic misplacement or through etymologic incorrectness —the former having been of frequent, the latter of rare, occurrence.

To illustrate the argument, I have chosen the genus *Vahea*. . . . . Some difficulty arises in fixing the precise date of the first publication of this genus, because the 'Illustration des Genres,' in which at page 292 of tome 2, and on planche 169, *Vahea gummifera* was established by Lamarck, was elaborated at a time when horrors of war, intensified by their duration and extensiveness, were disturbing all peaceful scientific research at the verge of the last and at the commencement of the present century; thus the "Illustration," which was arranged according to the Linnean system, and had therefore *Vahea* in the *Pentandria*, though commencing to appear in 1791, became finished only by Poiret in 1823 (as I notice in my own bound copy), long after its originator had been struck with blindness, a calamity which he had to bear during many of the last years of his life. Collaterally also the volumes of Lamarck's 'Encyclopédie Méthodique' were successively issued, commenced in 1783, but continued from 1804—1817 by Poiret also; and as that work was arranged alphabetically, *Vahea* could take its place only in the last volume. This led to the supposition that the description of *Vahea* was issued only in 1817, and seemingly for this reason the venerable Bentham, in the ever-memorable 'Genera Plantarum,' which resulted during the last twenty years as one of the main achievements of his and Sir Joseph Hooker's great labours, thought proper to suppress *Vahea*, when observing its identity with the genus *Landolphia*, which latter became described and figured in 1804 by Palisot de Beauvois ('Flore d'Oware, i., 54, t. 34). Nevertheless I felt persuaded that even Lamarck's plate alone of *Vahea gummifera* was sufficient for claiming priority, and with this view I transferred *Landolphia* to *Vahea*, when in the Calcutta, Sydney and Cassel editions (the latter a translation by Dr. Goeze) of my 'Select Plants for Industrial Culture,' and also in the enlarged English edition of Wittstein's 'Organic Constituents of Plants' I had to deal with the India-rubbers among other plants. But eager to ascertain whether the views held by me were correct, I incidentally addressed M. Alphonse de Candolle, whose illustrious parent had much co-operated botanically with Lamarck, especially by editing and much enlarging the third edition of the 'Flore Française' as published in 1805. This leading phytographer, who had himself, for his father's "Prodromus," in 1844, elaborated the *Apocynaceæ*, to which also *Vahea* belongs, affords me now from Geneva (under date of 27th July, 1882) the desired information, which, so far as *Vahea* is concerned, I verbally translate:—"Your question, relative to the parts (livraisons) of Lamarck's illustration, has given me some trouble, as our copy at Geneva does not indicate anything. Fortunately, while searching through the old periodicals, I found in Römer's 'Archiv für die Botanik,' ii. (1799) that Millin had spoken of Lamarck's publication in his 'Magasin Encyclopédique, vol. i. As I had not this at Geneva, I asked Dr. Fournier to search for it in Paris, and to give if possible the dates of the numbers of Lamarck. He found that Millin did allude to them in 1797, by saying the sixtieth livraison had appeared, and that the number of

plates published was seven hundred. We need therefore not look further at what date each number came out, as it is certain that *Vahea* and all the names anterior to plate 701 are older than those of Palisot de Beauvois, his belonging all to the present century. If Fournier should succeed in finding out the dates of each number of Lamarck, he will likely publish them in the 'Bulletin de la Société Botanique de France." It remains still to be noted that nearly forty years ago Alphonse de Candolle regarded already *Pacouria* of Aublet ('Histoire des Plantes de la Guiane Française,' i., 268, t. 105) as closely allied to *Vahea;* but even if both should prove congeric it would be best to adhere to the appellation *Vahea*, because Aublet in the same work has among *Compositæ* a genus *Pacourina*, vol. ii., 800, t. 316 (1775), which the elder De Candolle and lately also Bentham and Hooker have maintained.

[In the last number (the 94th) of his 'Fragmenta,' Baron von Mueller points out that the well-known Sapotaceous genus *Bassia* is not the rightful possessor of that name. He says: "*Bassia* generice stabiliebatur ab Allioni in Mélanges de Philosophie et de Mathématique pour les années 1762–1755, Turin, iii. 177, t. iv. f. 2 (1766) sub titulo: Stirpium aliquot descriptiones cum duorum novorum generum constitutione. Tali modo igitur *Bassia* inter Salsolaceas apparebat ante Koenigii itineris in Tranquebarium inceptionem.––Bassiæ inter Sapoteas synchrona est *Illippe* (Koenig in Linn. Mantiss. alter. 563, anno 1771, nomen quoque hodie sine scrupulo adhibendum." Although some temporary inconvenience may result, it appears to us that the Baron's view is the only one which is logically tenable.—Ed. Journ. Bot.]

Notices of Books.

Flora of British India. By Sir J. D. Hooker, C.B., K.S.I. Part ix. [*Vacciniaceæ—Apocynaceæ*]. London: L. Reeve & Co. [Dec. 1882.]

The steady progress of this very important contribution to our colonial floras is a matter for congratulation. Sir Joseph Hooker has been fortunate in securing the active co-operation of so accurate and steady a worker as Mr. C. B. Clarke, who is responsible for the greater portion of the part now before us, the orders *Sapotaceæ*, *Ebenaceæ*,—which we had expected Mr. W. P. Hiern would have undertaken,—*Myrsineæ* and *Styraceæ*, having fallen to his share, while Sir Joseph Hooker has elaborated the *Primulaceæ* and *Apocyneæ*. It would be impossible for anyone possessed of less knowledge than the illustrious botanists named to criticise the execution of the work from the botanical standpoint; but there are one or two minor, though not unimportant, matters which suggest a word or two of comment.

We have before animadverted* upon the unfortunate and misleading practice of quoting as if from the 'Genera Plantarum' names which are not to be found in its pages. Both Sir Joseph Hooker and Mr. Clarke constantly sin in this manner. Thus we have—

"*Alyxia gracilis* Benth. in Gen. Pl. ii. 697 [698]."
"*Rauwolfia densiflora* Benth. in Gen. Pl. ii. 697."
"*Baissea acuminata* Benth. in Gen. Pl. ii. 719."
"*Rhynchodia Wallichii* Benth. in Gen. Pl. ii. 720."

None of these names are to be found in the 'Genera.' Of course Mr. Daydon Jackson will take care to set all this right in his new 'Steudel' (which all botanists will be glad to know is making steady progress); but people who have not the 'Genera' to refer to, or are content to take their names as the authority of the 'Flora of British India,' will append "Benth." to these names as a matter of course, although "Hook. f." is the real authority. Mr. Clarke (p. 588) names two species of *Symplocos* thus:—

"*S. Henscheli* Benth. in Gen. Pl. ii. 669. *Cordyloblaste Henscheli* Moritzi."
"*S. Maingayi* Benth. in Gen. Pl. ii. 669."

We turn to the reference, and find "Sect. 2. *Cordyloblaste*" of the genus *Symplocos*, consisting of two species, "*Cordyloblaste* Moritz. in Bot. Zeit. 1848, 604, et species nova a Maingayo lecta." Even if it be assumed that Mr. Bentham elaborated the *Styraceæ* for the 'Genera,' and that he would have retained for Moritzi's plant its original specific name, what evidence is there in the above extract—all that bears upon the subject—that he named Maingay's plant *Maingayi*?

In dealing with the *Primulaceæ* Sir Joseph Hooker appears to have overlooked a paper by Klatt, on the species collected by the brothers De Schlagintweit, in High Asia, in 1855–57, published in this Journal for 1868, pp. 120–125. In this paper is described and figured (t. 78) a new species of *Primula*, *P.* (*Aleurita*) *Telemachica* Klatt, which finds no mention in the 'Flora of British India.' *Lysimachia evalvis* Wall., is said to be "apparently identical with the Chinese *L. Fœnum-græcum* Hance MSS."; but this latter species was fully described by Dr. Hance in this Journal for 1877 (p. 355), where it is said to be "closely allied to *L. ramosa* Wall." *L. evalvis* is scentless, but certainly seems otherwise to correspond very closely with Dr. Hance's specimen of *L. Fœnum-græcum* in the National Herbarium. Under *L. javanica* Bl. are cited as synonyms "*L. consobrina* Hance MSS., *L. decurrens* Hance Herb." *L. consobrina* was published by Dr. Hance in 1866 (Ann. Sci. Nat., 5 Sér. v. 244), and has since been reduced by him (Journ. Bot., 1877, 357) to *L. decurrens* Forst.—an identification which is borne out by Forster's type-specimen in the National Herbarium and apparently accepted by Sir Joseph Hooker, who includes New

* 'Journ. Bot.,' 1882, p. 187.

Caledonia in the distribution of the species. It is not easy to understand why Blume's name (1825) should take precedence of Forster's, published in 1786. A new species, *L. chenopodioides*, is cited as of "Watt in Journ. Linn. Soc. ined.," but it does not appear in his paper on Indian *Primulaceæ* recently published in the Linnean Society's Journal. Under *L. prolifera* Klatt, the MS. name *lineolata*, under which "Lysimachia No. 3" of Strachey and Winterbottom's Himalayan Herbarium was distributed, might have been cited. *L. oborata* is quoted as of "Herb. Ham.; Wall. Cat. 1488." We do not know on what authority Hamilton's name is attached; there is certainly no plant so named in his herbarium, and Wallich, in his Catalogue,—or rather 'List,'—no. 1488, calls the plant *L. oborata* Wall. With regard to the new species of *Primula* a point of some difficulty arises. On the last page (index excluded) appears a statement that "all the species here *for the first time described* will be found, together with figures of them, in a paper by Dr. Watt, shortly to be published in the 'Journal of the Linnean Society'"; and in the 'Flora,' "Watt in Journ. Linn. Soc. ined." is appended to the names of most of these. Dr. Watt's paper appeared on December 18th, and we believe we are accurate in saying that this was the first publication of these species. Of course, had the description first appeared in the 'Flora' as stated, "Hook. fil." instead of "Watt" would have had to be cited by subsequent writers as the authority for them.

We have already referred to the new spelling of the name *Willughbeia*—"*Willoughbeia*"—which is adopted throughout the genus. At first sight this seems only another case of *Chinchona* v. *Cinchona*. Had it been so, the innovation would have been unjustifiable; but when we find that the name of the friend of Ray, whom it commemorates, was always spelt Willughby,* we are at a loss to imagine what can have suggested the alteration. Miquel's genus *Micrechites* is spelt *Microchites*, but this is probably merely a slip.

It need hardly be added that criticism of this kind does not, and is not intended to, detract from full recognition of the value of the work as a whole. But we venture to think that a little more attention to the rules of nomenclature would improve what is as it stands a most useful Flora.

Mr. E. M. Holmes has issued the first fasciculus, containing 25 species, of his 'Algæ Britannicæ rariores exsiccatæ.' Twenty of the species are new to Britain, and the remainder are very rare. Mr. Holmes writes:—"No. 5 (*Dictyosiphon hippuroides*) is of especial interest, since Agardh, erroneously I feel sure, regards it as a form of *Chordaria flagelliformis*. It is never met with in the South of England, where *C. flagelliformis* is abundant, and in structure and fructification is so exactly a *Dictyosiphon* that it is difficult to

* "That excellent person, Mr. Francis Willughby, lately deceased."—Ray, Preface to 'Observations,' 1673.

understand Agardh's determination, except by supposing that on the shores of Norway and Sweden it is almost always found on that plant, just as *Elachista fucicola* or *Polysiphonia fastigiata* are on *Fucus* in this country. No. 23 is a plant which has long passed under the name of *Sphacelaria plumosa*, but it is quite distinct from Lyngbye's plant in having fruit on the *ultimate ramuli*. No. 1 has been identified as the *Sphacelaria plumosa* of Lyngbye by a comparison with a portion of Lyngbye's type-specimen, lent to me for the purpose by Dr. Bornet. Lyngbye's plant has fruit on small *special branches*, forming a dense velvety layer surrounding the main stem or primary axes, and is therefore a *Cladostephus*, with which also it agrees in stem structure. I have therefore named his plant *Cladostephus plumosus*, and the other *Sphacelaria plumigera*." The fasciculus is well mounted and arranged; and the specimens, although sometimes small, on account of their extreme rarity, are well selected.

Under the title 'Colin Clout's Calendar' (Chatto & Windus), Mr. Grant Allen reprints a series of essays from the 'St. James's Gazette.' "The greater number of the papers are botanical, and these," says Mr. Allen, "I hope will be found to contain some new and original evolutionary views." We trust the said views will be found more accurate than some of the facts upon which they are based. Thus we read, "Whenever you find a single comparatively inconspicuous plant among these families—for example, Solomon's Seal, with its small drooping greenish-white blossoms—one is sure to find also that it is a bulbless annual"! This is "new, but not true." The essays, however, are very pleasant reading,

'Guesses at Purpose in Nature with especial reference to Plants,' by W. Powell James, M.A. (S. P. C. K.), is a work which those, who do not altogether accept the views supported by Mr. Grant Allen, will be glad to possess; it is carefully written, and contains much useful information conveyed in a pleasing manner.

We are glad to record the appearance of another part (the 15th) of Baillon's admirable 'Dictionnaire de Botanique' (Cycl—Dict.). Valuable as it is, its usefulness will be seriously impaired unless some means of hastening its publication be found. It is just two years since part 14 was issued, and the first part appeared in 1876.

Mr. Hemsley continues to make steady progress with the Botany of the 'Biologia Centrali-Americana'; in the last part issued (in January) the *Coniferæ* are begun.

We have received Part x. of Mr. M'Alpine's carefully-coloured 'Botanical Atlas' (W. & A. K. Johnston), which contains plates devoted to Bladder Wrack and Tangle, Iceland Moss, Moss, and Mushroom and Red Seaweed.

Possessors of sets of the 'Garden' will be grateful to Mr. Robinson for the 'General Index to the first twenty half-yearly volumes' which has lately been issued.

'Children's Flowers' (Religious Tract Society) would form a suitable reading-book for quite young children.

Mr. L. H. Grindon announces a work entitled 'The Shakspere Flora,' which will be issued in May by Messrs. Palmer and Howe, of Manchester.

Dr. Carrington and Mr. W. H. Pearson announce the publication of the third fasciculus of their useful 'Hepaticæ Britannicæ Exsiccatæ' (including nos. 151 to 215).

New Books. — F. Townsend, 'Flora of Hampshire' (London L. Reeve, 16*s.*). — J. Cameron, 'The Gaelic Names of Plants' (London & Edinburgh: Blackwood & Sons, 7*s.* 6*d.*). — William Jolly, 'John Duncan, Weaver and Botanist' (London: Kegan Paul, 9*s.*).—G. M. Thomson, 'The Ferns and Fern Allies of New Zealand.'

Articles in Journals.

American Naturalist (Jan.).—D. H. Campbell, 'Development of male prothallium of Horsetail.' — G. Macloskie, 'Achenial Hairs and Fibres of *Compositæ*.'—(Feb.) J. B. Ellis, 'New Species of North American Fungi.'

Ann. and Mag. Nat. Hist. — R. Kidston, '*Sphenopteris crassa* Lindl. & Hutt.' (1 plate).

Annales des Sciences Nat. (6 Sér. xv. no. 2). — J. H. Fabre, 'Les Sphériacées du departement de Vaucluse' (concluded; 3 plates). — G. Bainier, 'Observations sur les Mucorinées' (*Pirella*, gen. nov.: 3 plates).—J. Vesque, 'L'Histologie de la Feuille des Caryophyllinées.'

Botanical Gazette (Jan.). — Biography of L. C. S. Rafinesque. —A. F. Foerste, 'Hibernaculum of *Asarum canadense*.' — S. T. Fergus, '*Epiphegus virginiana*' (1 plate).—A. P. Morgan, 'Kentucky Fungi.'—(Feb.) Biography of John Torrey.

Botanisches Centralblatt (xiii. no. 6). — F. Hildebrand, 'Ueber einige Fälle von verborgenen Zweigknospen.' — J. Kühn, 'Eine neue Milbengalle auf dem Straussgrase' (*Dendroptus Krameri*, n. sp.). — (no. 7). C. Sanio, 'Zwei neue Moose des Dovrefjeld in Norwegen' (*Webera* (*Pohlia*) *trachyodontea*, *Mielichoferia defecta*, spp. nn.).—J. T. Sterzel, '*Dicksoniites Pluckeniti* Schloth.' (1 plate). —T. A. Teplouchoff, '*Viola Willkommii*, n. sp.'

Botanische Zeitung (Jan.).—J. Boehm, 'Ueber Stärkebildung aus Zucker.' — A. de Bary, 'Zu Pringsheim's Neuen Beobachtungen über den Befruchtungsact der Gattungen *Achlya* und *Saprolegnia*.'—(Feb.). J. Reinke, 'Die Autoxydation in der lebenden Pflanzenzelle.' —J. Wiesner, 'Eine Bemerkung zu dem Aufzatze des Herrn. Wortmann über Nutation.'

Botaniska Notiser. — E. Adlerz, 'Studier öfver bladmossorna i jemtländska fjälltrakterna 1882.' — L. M. Neuman, 'Studier öfver Skånes och Hallands flora.'

Bulletin of Torrey Botanical Club (Jan.).—W. R. Dudley, 'Leafy berries in *Mitchella repens*' (1 plate). — G. E. Davenport, 'Fern Notes' (*Aspidium Filix-mas* in California; *Botrychium Virginianum* var. *gracile*; Abnormal Ferns).—G. Winter, 'New North American

Fungi' (*Sorosporium Ellisii*, *Ustilago Vilfæ*, *Gonatobotrys maculicola*, spp. nn.).

Bull. Soc. Bot. Belgique. — F. Crépin, 'Primitiæ Monographiæ Rosarum' (concluded). — T. Durand & H. Pittier, 'Catalogue de la Flore Vaudoise' (contd.).

Flora (Feb. 1). — E. Kutscher, 'Ueber die Verwendung der Gerbsäure im Stoffwechsel der Pflanze.' — (Feb. 8). J. Müller, 'Lichenologische Beiträge' (Australian Lichens concluded: *Parmelia hospitans*, *P. æneofusca*, *P. duplicata*, *Pertusaria Moffatiana*, *Patellaria Ramalinæ*, *Buellia ventricosa*, *Graphina brachyspora*, spp. nn.).

Gardeners' Chronicle (Feb. 3).—H. G. Reichenbach, '*Trichoglottis cochlearis*, n. sp.). — V. Ricasoli, '*Agave mexicana*' (fig. 22). — (Feb. 10). J. G. Baker, '*Agave Alibertii*' (*Alibertia intermedia* Marion).—(Feb. 17). W. T. T. Dyer, '*Zamia Fischeri*' (fig. 29): *Calodendron capense* (fig. 30). — (Feb. 24). M. T. Masters, '*Pinus Veuke*' (figs. 32–34): *P. excelsa* (fig. 35).—H. B. Biden, 'Abnormal Inflorescence in *Cactus speciosissimus*' (fig. 36).

Geological Magazine. — W. Carruthers, 'On the foliage of *Sigillaria Serlii* Brongn' (1 plate).

Journal of Royal Microscopical Society.—G. F. Dowdeswell, 'On a minute form of parasitical Protophyte.'

Magyar Növénytani Lapok (Jan.).—L. Simcovics, '*Inula hybrida* Baumg.'—J. L. Holuby, 'Mycological Notes.'

Midland Naturalist. — W. B. Grove, 'Nomad Fungi: Reclassification of the *Uredineæ*.'—W. Phillips, 'Truffles in Shropshire.'—J. E. Bagnall, 'Flora of Warwickshire' (*Umbelliferæ*, contd.).

Nature (Feb. 15). — Fritz Müller, 'Two kinds of Stamens with different functions in the same flower.'

Nuovo Giorn. Bot. Italiano (Jan. 20). — A. Goiran, 'Prodromus Floræ Veronensis' (contd.: *Orchidaceæ* and *Iridaceæ*). — C. Massalongo, 'Monstruosità osservata nel fiore del genere *Iris*' (1 plate). —G. Arcangeli, 'Osservazioni sull' impollinazione in alcune Aracee.' —L. Macchiati, 'Sull' accrescimento intercalare della *Lonicera chinensis*.'

Œstrr. Bot. Zeitschrift. — B. Blocki, 'Zur Flora von Galizien.' —J. B. Keller, 'Rhodologische Beiträge.' — J. B. Wiesbaur, 'Zur Flora des Eisenberger Comitates.' — D. Hirc, 'Zur Flora von Croatien.' — A. Kerner, 'Schedæ ad Floram exsiccatam Austro-Hungaricam.'—P. G. Strobl, 'Flora des Etna' (contd.).

Proc. Linn. Soc. N. S. Wales (vol. vii., part 3).—J. E. Tenison-Woods, 'Botanical Notes on Queensland.'—Id., 'A coal-plant from Queensland' (*Equisetum rotiferum*, n. sp.) — W. Woolls, 'Forage-plants indigenous to New South Wales.' — K. H. Bennett, '*Myoporum platycarpum*.' — E. Haviland, 'Fertilization of *Philotheca australis* and *Boronia pinnata*.'

Quarterly Journ. Microscopical Science (Jan.). — E. Klein, 'On the relations of Pathogenic and Septic Bacteria.' — L. Elsley, 'Plant-Cells and living Matter.' — F. O. Bower, 'On Plasmolysis and its bearing upon the relation between the cell-wall and Protoplasm' (1 plate).

LINNEAN SOCIETY OF LONDON.

December 7, 1882.—Sir J. Lubbock, Bart., President, in the chair.—The following gentlemen were elected Fellows of the Society :— The Rev. R. Baron, F. O. Bower, T. H. Corry, O. L. Fraser, D. Houston, A. W. Howitt, H. McCallum, E. A. Petherick, S. Rous, and H. C. Stone.— The Rev. R. P. Murray showed specimens of *Althæa hirsuta*, *Vicia Orobus*, and *Phlomis fruticosa*, obtained by him last summer in Somerset. — Mr. Dyer exhibited and explained maps illustrative of the Phylloxera in Spain and Portugal. In 1881 there was only one infested centre to the east of Oporto ; in 1882 there were five others, and there could be little doubt that it would over the whole of northern Portugal. In Spain the vineyards of the province of Malaga were more than two-thirds infested ; there seemed no hope that any would escape, and the consequent loss would be very great, as the annual value of their products was a million and a half, more than that of all the other agricultural products put together. — Mr. Dyer also exhibited photographs of the cultivation of *Cinchona succirubra* (trees eight to ten years old, 25–30 ft. high) and *C. officinalis* in Ceylon.— A paper by J. G. Otto Tepper was read, wherein he recounted the discovery by him, near Adelaide, South Australia, of above ninety species of Tasmanian plants. — A contribution by Dr. W. Nylander and the Rev. J. M. Crombie was read, "On a Collection of Exotic Lichens made in Eastern Asia by the late Dr. A. C. Maingay.' Those enumerated were from British Burmah, China and Japan ; some are interesting as illustrations of Lichen distribution, and others as new species and varieties.— The Rev. R. P. Murray afterwards made some remarks on cleistogamic flowers of *Hoya carnosa* producing fertile flowers.

Dec. 21.—A. W. Bennett, Esq., M.A., in the chair.—Prof. A. Ernst, of Caracas, and Dr. W. C. Ondaatje, of Ceylon, were elected Fellows.—Mr. Thos. H. Corry read a paper 'On the Development and Mode of Fertilization of the Flower of *Asclepias Cornuti* Dcne.,' of which the following is a summary :—R. Brown (1809), J. B. Payer (1857), and H. Schacht, have all made *Asclepias* the subject of careful study. Mr. Corry has nevertheless been able to add new observations thereto. The large disk-shaped body which crowns and is common to the two styles, and which he terms for convenience the *stigma-disk*, is shown to be formed by the fusion of the two style-apices, and not by that of the two stigmas. He has carefully indicated the mode of formation of the stigmatic corpuscula and their appendages, both of which are simply elaborate cases of the external excretion of a viscid liquid gum from certain papilliform cells of the surface of the stigma-disk, which afterwards dries and hardens. The anther-alæ he finds originate as lateral processes of the connective; and he has further ascertained, in opposition to the ideas of Brown and Brongniart, that at five points,

directly opposite the five alar fissures, a slight means of communication exists between the parts enclosed in the interior of the staminal tube and the exterior of the flower. Owing to the adhesion of the lower edge of the stigma-disk to the apex of the staminal column not being so complete here as in the regions of the five anthers, five radial furrows are in consequence left, by means of which the papillar tissue of the stigma, which he finds clothes the whole inferior surface of the stigma-disk, is exposed. From a very complete study of the different stages in the development of the pollen-mass in *Asclepias*, it appears that this genus presents, in its *entire* details, a perfectly unique, isolated, and peculiar case of formation. The earlier stages are only to be found paralleled in the single instance of *Zostera* (which had been studied by W. Hofmeister), a genus that affords either the most primitive or the most aberrant type of pollen formation known. The later stages find no precise parallel in the entire range of the vegetable kingdom. The late period to which the tapetum persists, and the conversion of those walls of its cells which adjoin the contents of the loculus into cutin to form the firm investing membrane of the pollen-mass, the absence of an endothecium, and the peculiar mode of dehiscence of the anthers, are among the especially noteworthy features. In connection with fertilization, the mode of formation of the curious combination of corpuscula with each other is elucidated, and these series are shown to be of two kinds, *viz.*, unilateral and dichotomous. Cross-fertilization is the great law in *Asclepias*, and in some cases it is requisite that the cross should be not only between distinct flowers, but between those of distinct individuals produced from seed in order that progeny may result, the plant apparently being self-impotent to its own pollen.—Mr. Baker then read the second part of his 'Contributions to the Flora of Madagascar,' in which he dealt with the descriptions of about one hundred and sixty new gamopetalous dicotyledons, gathered in Madagascar by recent English collectors, especially the Rev. R. Baron, F.L.S., of the London Missionary Society. The most interesting is *Schismatoclada*, a new genus of *Rubiaceæ* allied to *Cinchona*. The other new genera are *Tetraspidium*, of the group of semiparasitic *Scrophulariaceæ*, such as *Pedicularis* and *Melampyrum*, which turn completely black in drying, remarkable for its four shield-shaped one-celled anthers; *Forsythiopsis*, an erect shrubby Acanthaceous genus, with flowers like *Forsythia* and leaves not fully developed till after the flowers fade; and *Monachochlamys*, another genus of *Acanthaceæ* allied to *Mendoncia* and *Thunbergia*, with numerous small flowers, each contained in a persistent spathaceous bract, like the hood of a Franciscan monk. Of representatives of well-known European genera the present collection includes two species of *Anagallis* nearly allied to *tenella*, two Ajugas, a *Salvia*, two Micromerias, three species of *Stachys*, five Senecios, three Cynoglossums; and a *Lysimachia*. The genera represented most largely are *Danais*, *Veronica*, *Helichrysum*, *Gaertnera*, *Clerodendron* and *Hypoestes*. There is a single species of the beautiful Acanthaceous genus *Strobilanthes*, which is

represented in India by above a hundred species, and a new *Vinca*, allied to *rosea*. Of endemic genera, known previously in the Island, there are new species of *Aspilia*, *Epallage* and *Oncostemum*. Of Cape types the principal are a *Lightfootia*, a *Halleria*, an *Alectra*, and two heaths of the genus *Philippia*.—Mr. Baker also communicated a paper containing descriptions of about thirty new plants from Fiji, named, but not characterised by Mr. John Horne, in his recently-published report to Sir Arthur Gordon on the economic capabilities of that group of islands, which we noticed in this Journal for 1882 (p. 27).—The Rev. J. M. Crombie read a short paper on additions to the Lichens of the 'Challenger' Expedition.

January 18, 1883.—Sir John Lubbock, Bart., President, in the chair.—The following gentlemen were elected Fellows of the Society: Edwd. A. L. Batteris, Alf. J. Burrows, Edgar F. Cooper, Prof. J. A. Harker, and Geo. Lewis. — Mr. H. Groves exhibited a specimen of *Ranunculus ophioglossifolius* from Hampshire (see p. 51). —A paper was read, "On the fall of branchlets in the Aspen (*Populus tremula*)," by Samuel G. Shattock. The author remarks that in the exogenous trees, with some few exceptions, the death of a branchlet is followed by its ultimate detachment, but only after the lapse of a long period, during which the wood of the dead part undergoes changes which render it so brittle that it is readily snapped across. In this process the living parenchyma of the bark furnishes by transverse partitioning a line of corky tissue, sharply defining the living from the dead structures. In a few cases demarcation ensues in the pith and medullary rays, the woody tissue and bast-fibres alone remaining continuous. After separation of the dead stump, the fractured surface is covered in by an overgrowth of new tissue produced from the cambium. There is still another process, named many years ago by the Rev. M. J, Berkeley "Cladoptosis." In this externally the union of the branchlet with the branch shows a marked enlargement similar to what occurs at the base of petioles. Through the middle of this disarticulation takes place. A longitudinal section shows a general increase of the medullary area, wood, and cortical system.

We are glad to learn that it has been decided to open Kew Gardens to the public at 12 instead of 1 p.m. When the agitation which has resulted in this satisfactory alteration was first set on foot, we expressed an opinion (Journ. Bot., 1878, p. 128) that "their earlier opening was much to be desired," and that any danger of interference with the strictly scientific work of the Gardens was "wholly in apprehension"; and we shall be surprised if the Kew officials find any cause to complain of the consequences of a concession which might, we venture to think, have been more generous than it is at present.

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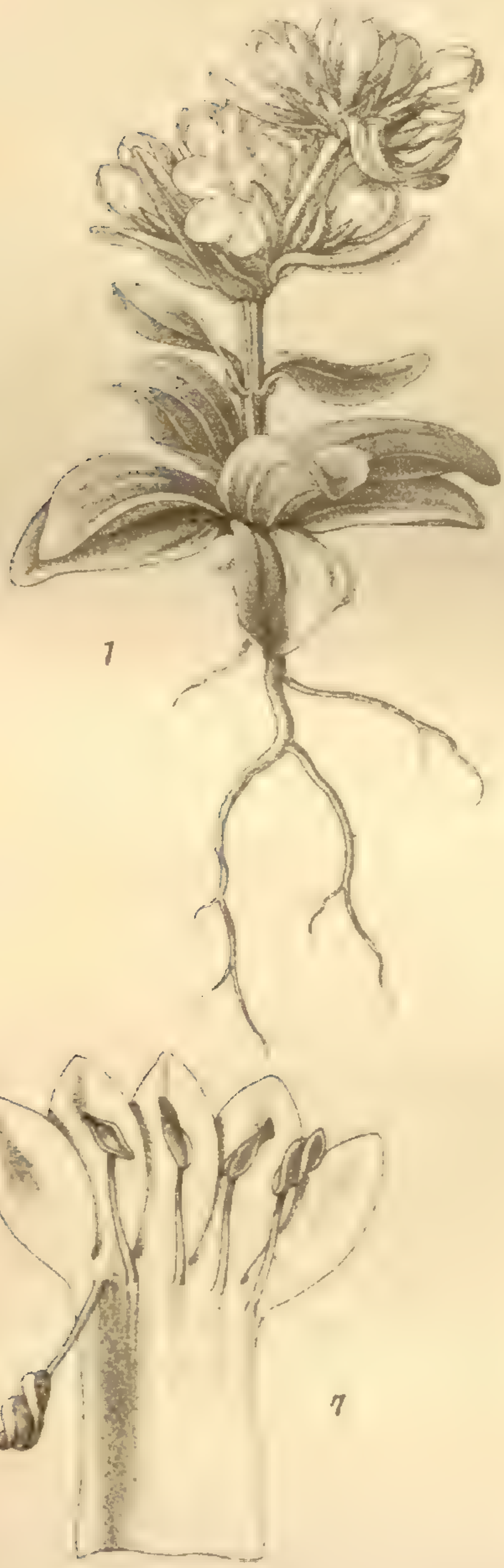

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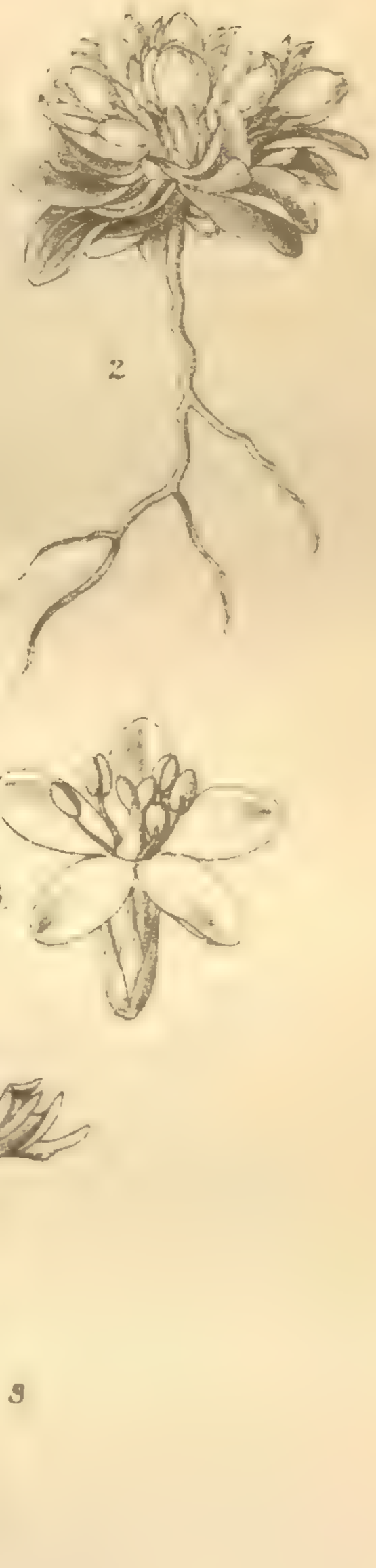

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F Townsend del.

J.N.Fitch, Lith.

1.6 Erythræa capitata *Willd. var.* sphærocephala *Towns.*

7.8. E. Centaureum *Pers. var.* capitata *Koch.*

L Reeve & Cº London

F Townsend del. J.N.Fitch Lith

Erythraea capitata *Willd. var:* sphaerocephala *Towns.*

L Reeve & Cº London

A SYNOPSIS OF THE GENUS *SELAGINELLA*.

By J. G. Baker, F.R.S., &c.

(Continued from p. 84.)

32. **S. Jamesoni**, n. sp.—Stems very slender, trailing, stramineous, 3–6 in long, sulcate on both faces, forked and distantly pinnately branched, with slightly compound ascending branches. Leaves dimorphous, those of the lower plane lax except towards the tip of the branches, erecto-patent, ovate-oblong, subobtuse, ½ lin. long, moderately firm in texture, more rounded on the lower side of the distinct midrib, cuneate on both sides at the base, obscurely ciliated; leaves of upper plane half as long, oblong, acute, ascending. Spikes very short, ¾ lin. diam.; bracts ovate, thin in texture, strongly keeled, acute, but not cuspidate.

Hab. Andes of Ecuador near Quito, *Jameson*! *Sodiro*! A near ally of *S. delicatissima*.

33. **S. panurensis**, n. sp.—Stems densely matted, 1–2 in. long, distantly pinnately branched, the branches simple or slightly compound. Leaves of the lower plane crowded, erecto-patent, oblong-lanceolate, ½–¾ lin. long, obtuse or subacute, flat, moderately firm in texture, the distinct midrib nearly central, the base on the upper side not cordate nor imbricated over the stem, not ciliated; leaves of the upper plane half as long, oblong, acute, not cuspidate, much imbricated, strongly keeled. Spikes short, square, ½ lin. diam.; bracts ovate-lanceolate, crowded, strongly keeled.

Hab. Panuré, on the Rio Uapes, North Brazil, *Spruce* 2861!

34. **S. vestiens**, n. sp.—Stems densely matted, about an inch long, forked and copiously pinnately branched, with short 2–3-furcate branches. Leaves of the lower plane crowded, oblong-lanceolate, acute, involute, ½–¾ lin. long, green, moderately firm in texture, more produced on the upper side of the distinct midrib, ciliated on both sides near the base, the upper cordate and imbricated over the stem; leaves of the upper plane a third as long, ovate, acute, imbricated. Spikes short, copious, square, ½–¾ lin. diam.; bracts ovate-lanceolate, crowded, strongly keeled.

Hab. Goyaz, on the Morro de Canto Gallo, on shaded rocks, *Burchell*!

35. **S. cladostachya**, n. sp.—Stems trailing, about an inch long, distantly pinnately branched, the short branches usually simple. Leaves of the lower plane ovate-lanceolate, subacute, ½ lin. long, moderately firm in texture, the midrib distinct, those of the main stem spreading and rather spaced, those of the branches crowded, ascending, imbricated, incurved, all the margin shortly ciliated, the upper near the base more distinctly so, its base cordate and so much imbricated over the stem that the latter is quite hidden; leaves of the upper plane half as long, ovate, acute,

imbricated. Spikes very short; bracts ovate-lanceolate, strongly keeled.

Hab. Goyaz, on the Morro de Canto Gallo, with *S. vestiens*, *Burchell!*

36. S. CAVIFOLIA A. Br. in Ann. Sc. Nat., ser. 5, vol. iii., 272.—Stems very slender, pale, trailing, 2–3 in. long, flat on the faces, with numerous alternate pinnately-arranged simple or slightly compound erecto-patent branches. Leaves of the lower plane ascending, suborbicular, obtuse, ½ lin. long, pale green, firm in texture, flat, the midrib distinct, the edge denticulate, the upper half much more produced, cordate at the base and much imbricated over the stem; leaves of the upper plane half as long, oblong, acute, much imbricated. Spikes very short, 1 lin. diam.; bracts ovate, much imbricated, acute, not cuspidate, strongly keeled.

Hab. Andes of Bogota, *Lindig* 1511! Well marked by its trailing habit, nearly simple branches, and pale close orbicular rigid leaves.

37. **S. trifurcata,** n. sp.—Stems very slender, pale, trailing, 3–6 in. long, angled on the faces, regularly pinnately branched, with short 2–3-furcate erecto-patent branches. Leaves of the lower plane close, spreading, ovate, acute, very oblique, ½ lin. long, flat, pale green, firm in texture, denticulate, much more produced on the upper side of the distinct midrib, the base cordate and much imbricated over the stem; leaves of the upper plane half as long, oblong, cuspidate, much imbricated. Spikes copious, short, square, ½ lin. diam.; bracts ovate, cuspidate, much imbricated, strongly keeled.

Hab. Panuré, on the Rio Uapes, *Spruce!* Habit of *serpens*, but totally different in the leaves.

38. **S. cryptogæa,** n. sp.—Stems slender, trailing, densely intermatted, 2–3 in. long, the erecto-patent branches simple or little compound. Leaves of the lower plane crowded even on the main stem, erecto-patent, oblique ovate, acute, ½ lin. long, bright green, moderately firm in texture, dilated, cordate, strongly ciliated and much imbricated over the stem on the upper side at the base; leaves of the upper plane a third as long, oblique ovate, acute, much imbricated. Spikes short, sharply square, ½ lin. diam.; bracts ovate, acute, crowded, strongly keeled.

Hab. On the ground on the banks of the Rio Uapes, North Brazil, *Spruce* 2905! An ally of *S. radiata*, from which it differs by its short decumbent stems and crowded leaves.

39. **S. tarapotensis,** n. sp.—Stems trailing, 3–6 in. long, subterete on back and face, copiously pinnate, the lower branches elongated and copiously compound. Leaves of the lower plane close or rather spaced, oblong-lanceolate, acute, ¾–1 lin. long, bright green, moderately firm in texture, more produced on the upper side of the distinct midrib, shortly rigidly ciliated in the lower half of the upper edge, broadly rounded at its base and somewhat imbricated over the branch; leaves of the upper plane half as long, suborbicular, with a very long cusp. Spikes copious, square, ¼–½ in. long, 1 lin. diam.; bracts very dense, ovate cuspidate.

Hab. In North West Peru on Mont Campana and Mont Guayrapurima, near Tarapota, *Spruce* 4625 !

40. **S. acanthostachys**, n. sp.—Stems very slender, trailing, angled on both back and face, 2–4 in. long, copiously pinnate, the branches copiously compound. Leaves of the lower plane oblong-lanceolate, acute, $\frac{1}{2}$–$\frac{3}{4}$ in. long, bright green and moderately firm in texture, ascending, spaced, except at the tip of the branchlets, a little more produced on the upper side of the distinct midrib, its edge shortly rigidly ciliated, its base very cordate and much imbricated over the branch; leaves of the upper plane $\frac{1}{3}$–$\frac{1}{2}$ as long, oblique ovate, cuspidate, incurved. Spikes copious, square, $\frac{1}{2}$–1 in. long, $\frac{1}{2}$–$\frac{3}{4}$ lin. diam.; bracts ovate-lanceolate, rigid, very acuminate.

Hab. In North West Peru, on Mont Campana, *Spruce* !

41. S. BREVIPES Fée Fil. Bras. 226, tab. 75, fig. 1.—Stems trailing, 4–6 in. long, flat on the back, convex on the face, copiously pinnate, the lower branches elongated and copiously compound. Leaves of the lower plane crowded, spreading or rather ascending, oblong-lanceolate, subacute, $\frac{3}{4}$–1 lin. long, bright green and moderately firm in texture, much more produced on the upper side of the midrib, shortly rigidly ciliated towards the base, where it is cordate and much imbricated over the branch; leaves of the upper plane $\frac{1}{3}$–$\frac{1}{2}$ as long, broad ovate, with a long cusp. Spikes square, $\frac{1}{4}$–$\frac{3}{4}$ in. long, $\frac{3}{4}$ lin. diam.; bracts ovate cuspidate, strongly keeled.

Hab. On the Tejuca Mountains, near Rio Janeiro, *Burchell* 3008 ! Serra das Orgaos, *Glaziou* 2241 !

42. **S. Lindbergii**, n. sp.—Stems trailing, intermatted, 3–6 in. long, terete on the back, angled on the face, forked low down, copiously pinnate, the branches ascending, the lower copiously compound. Leaves of the lower plane close or slightly spaced on the branches, spreading, oblong-lanceolate, subacute, $\frac{3}{4}$–1 lin. long, more produced on the upper side of the midrib, with a strongly ciliated deeply cordate auricle on the upper side which reaches quite across the branch; texture moderately firm; upper border rather revolute; leaves of the upper plane a third as long, broad ovate, shortly cuspidate. Spikes copious, $\frac{1}{2}$–1 in long, 1 lin. diam., square; bracts ovate, acute, strongly keeled.

Hab. Minas Geraes, Brazil, *Lindberg* ! In St. Paulo, on the Serra de Cubatao, *Burchell* !

43. **S. incurvata**, n. sp.—*S. vaginata* Liebm., non Spring.—Stems trailing, 1–3 in. long, copiously pinnately branched, with short copiously compound cuneate erecto-patent branches. Leaves of the lower plane crowded, ascending, oblong-lanceolate, acute, at most a line long, moderately firm in texture, more produced on the upper side of the distinct midrib, shortly ciliated through the lower half of the upper edge, cordate at the base so that the branch is hidden; leaves of the upper plane $\frac{1}{3}$–$\frac{1}{4}$ as long, ovate, much imbricated, shortly cuspidate. Spikes copious, $\frac{1}{4}$ in. long, $\frac{1}{2}$ lin. diam., not sharply square; bracts ovate-lanceolate.

Hab. Mexico, in the province of Vera Cruz, *Liebmann* !

44. S. SERPENS Spring Mon. ii. 102. — *S. variabilis*, *varians*, *mutabilis*, and *jamaicensis*, Hort. *Lycopodium serpens*, Desv.—Stems

densely matted, quite trailing, reaching a length of 6–9 in., copiously pinnately branched, with numerous erecto-patent slightly compound branches. Leaves of the lower plane crowded, spreading, ¾ lin. long, ovate-oblong, obtuse, bright green, moderately firm in texture, the distinct midrib nearly central, both sides rounded and ciliated at the base; leaves of the upper plane a third as long, oblique oblong, acute. Spikes square, ¼—½ in. long, ½ lin. diam.; bracts broad ovate-cuspidate, crowded, strongly keeled.

Hab. West Indies. Cultivated in gardens since the days of Miller, and well known from the change that takes place in the colour of the leaves at different times of the day. Spring's Mexican plant is *S. Schiedeana*.

(To be continued.)

A NEW *POLYGONUM*, OF THE SECTION *PLEUROPTERUS*.

By H. F. Hance, Ph.D., &c.

Polygonum (Pleuropterus) **Forbesii**, sp. nov. — Caule erecto fistuloso vix flexuoso simplici angulato striato-sulcato minute muriculato, foliis in sicco tenuiter papyraceis subrotundis apice subito breviter acuminatis penninerviis subtiliter reticulatis venulis plurimis liberis more *Phymatodis* præditis utrinque præter costam nervosque minute muriculatos glabris subtus glaucescenti-pallidis circ. 3 poll. diametro petiolo muriculato 3 lin. longo, ocreis scariosis cylindricis truncatis 2½ lin. longis demum deciduis, paniculis axillaribus multifloris petiolo 2–3 plo longioribus, bracteis ovatis acutiusculis, floribus hermaphroditis, pedicellis apice incrassatis supra basin articulatis, perigonii segmentis oblongis obtusis exterioribus in alas secus pedicellum decurrentes expansis accrescentibus, achænio ovoideo trigono angulis incrassatis minute denticulatis lateribus concavis levibus, stylo brevissimo stigmatibus laciniatis.

Chi-fu, ad templum (sic dictum) bambusarum, d. 17 Sept. 1880, detegerunt F. B. Forbes et W. R. Carles. (Herb. propr. n. 22092).

An interesting addition to the small group to which it belongs, very distinct by the form of its leaves. Besides the four species enumerated by Bentham and Hooker fil.,* I have no doubt that the Arctic-Siberian *P. Pawlowskianum* Glehn belongs here, and not to the section *Aconogonon*, where its founder placed it.† I have been enabled to compare mine with all five plants.

It is not without sadness that I dedicate this, the last botanical novelty received from him, to my accomplished friend F. B. Forbes, one of its discoverers, who, to my deep regret, and very unfortunately for the interests of Chinese Botany, has recently bidden a final farewell to the Central Empire.

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* 'Gen. Plant.,' iii., 99. † 'Act. hort. Petrop.,' iv., 77.

ON THE FLORA OF THE UPPER TAMAR AND NEIGHBOURING DISTRICTS.*

By the Rev. W. Moyle Rogers, F.L.S.

(Continued from p. 47).

Wahlenbergia hederacea Reich.—IV. Near Okehampton.

Ligustrum vulgare L.—Common and I think native in all the districts.

Vinca minor L.—III. Bridgerule; denizen. Wood in Pyworthy; perhaps native.

Erythræa pulchella Fries.—I. Bude (Hind), on Efford Down, in good quantity. Near Tackbear.

Chlora perfoliata L.—I. Near Bude, in several directions and great quantity. Near Stratton, to the east, fairly abundant. Lacks personal authority for the vice-county in 'Topographical Botany.' Very rare in S.W. England.

Menyanthes trifoliata L.—III. Bridgerule Bog (Upper and Lower) and Scotland Bog; abundant.

Convolvulus Soldanella L.—I. Widmouth.

Cuscuta Epithymum Murr.—I. Seacoast from Sandymouth to Widmouth; frequent.

Antirrhinum Orontium L.—III. Bridgerule; one plant in Vicarage garden; colonist.

Veronica Buxbaumii Ten.—I. Bude. II. and III. Bridgerule. Probably quite general.

V. montana L.—III. Bridgerule.

V. scutellata L.—I. Tackbear (var. *pubescens*). Wainhouse Corner. II. and III. Remarkably frequent in ditches as well as in bogs. IV. Okehampton.

V. Anagallis L.—I. Near Bude (Hind):—by the stream at the N.W. end of Summerleaze Down, several plants; and in ditches near the river, in considerable quantity.

Euphrasia officinalis L., var. *tetraquetra*.—I. Willa Park Point; fairly abundant.

Bartsia viscosa L.—II. Wilsworthy Moor, in plenty; perhaps the same station as Mr. Baker's "Roadside near Whitstone."

Pedicularis palustris L.—I. Near Bude. Between Whitstone and Boscastle, frequent. II. By Canal at Bridgerule and for miles north and south of it, in great quantity. III. Bridgerule Bog. IV. Near Okehampton. Locally very abundant, and altogether much commoner than is usual in the S.W.

P. sylvatica L.—Frequent in all the districts, though not included in Dr. Hind's List.

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* I am indebted to the Rev. R. P. Murray for directing my attention to the misleading way in which I have used the word "Peninsula" in my note on *Galium sylvestre* (p. 40). I meant by it the counties of Devon and Cornwall; whereas in Mr. Watson's map Cornwall is "W. Peninsula," Devon "Mid Peninsula," and Somerset "N. Peninsula."

Melampyrum pratense L.—I. Tackbear. IV. Near Okehampton. Apparently uncommon.

Verbena officinalis L.—I. Stratton and Launcells Road. Marhamchurch, near the village. Boscastle. Trevalga. Tintagel. III. Near Pyworthy. Seldom more than a plant or two together.

Mentha viridis L.—III. Bridgerule, in the field "Lower Hill Park"; in considerable quantity, but no doubt only as a garden escape.

M. sativa L., a. *rivalis* and b. *paludosa* (and especially the latter) are common in all the districts.

Origanum vulgare L.—III. Roadside near Lew Down for a short distance.

Calamintha Clinopodium Spenn.—III. Bridgerule. Lifton. Uncommon.

C. menthifolia Host.—Common, but rather locally so, in all the districts.

Melissa officinalis L.—I. Between Stratton and Launcells. Near Marhamchurch. Boscastle. III. Bridgerule. Always near house or garden.

Salvia Verbenaca L.—I. About Bude (Hind), in some quantity. Apparently rare, as I have seen it nowhere else.

Scutellaria galericulata L.—II. Bridgerule, by the Canal. III. Bridgerule, by the river.

S. minor L.—I. Bog between Wainhouse Corner and Tresparrot. II. Bridgerule. III. Scotland Bog. Bridge Moor. Bridgerule Bog. IV. Near Okehampton.

Stachys ambigua Sm.—I. Between Launcells and Bridgerule. IV. Near Okehampton. New record for N. Devon.

Lamium album L.—III. About Pyworthy village. Holsworthy, close to the town, frequent. IV. About Okehampton. Very local; not seen at all on the Cornish side of the Tamar.

L. Galeobdolon Crantz.—IV. Near Okehampton.

Lithospermum officinale L.—I. Summerleaze Down, north-east end, in some quantity.

Myosotis cæspitosa Schultz.—II. and III. Bridgerule, common.

M. palustris With.—II. Roadside ditches near Whitstone and at Bennicott in the Launceston and Kilkhampton Road, in fair quantity.

M. repens Don.—I. Stibb. Marhamchurch. II. Bridgerule. Whitstone, &c., common. Queried for East Cornwall in "Topographical Botany," but in Fl. Plym. Mr. Briggs gives several localities for it in both his E. Cornwall districts. III. Bridgerule and neighbourhood, quite common.

M. versicolor Reich.—III. Bridgerule. IV. Near Okehampton.

Borago officinalis L.—I. Boscastle; rather abundant, but not native.

Symphytum officinale L.—II. Whitstone, two or three plants by well just opposite a cottage. Boscastle. Plainly only denizen.

Pinguicula lusitanica L.—III. Scotland and Bridgerule Bogs.

Lysimachia nemorum L.—I. St. Knighton's Kieve. II. and III. Bridgerule. Apparently not very common.

Anagallis tenella L.—Quite common.

Centunculus minimus L.—I. Launcells, roadside. II. Bridgerule, frequent. Quarry at St. Stephen's. III. Bridgerule and Pyworthy, unusually common in roadside ditches and wet ground generally.

Statice binervosa G. E. Sm.—I. Bude (Hind), on the "Castle Rock," several patches. Boscastle, in plenty. Dr. Hind names his Bude plant "*Dodartii*." I am inclined to place all I saw at Bude and at Boscastle under var. *intermedia*; but then I do not understand *Dodartii*.

Plantago lanceolata L.—b. *Timbali*. I. Bude. Introduced.

P. maritima L.—I. Near Tresparrot, more than a mile inland; as well as by the sea generally.

P. Coronopus L.—I. Seen only in the immediate neighbourhood of the sea.

Beta maritima L.—I. Boscastle.

Chenopodium polyspermum L.—I. Field near Tackbear.

C. Bonus-Henricus L.—I. Between Stratton and Launcells, on waste ground not far from a farm house.

Atriplex angustifolia Sm.—Common in all the districts.

A. erecta Huds.—II. and III. Bridgerule.

A. deltoidea Bab.—I. Bude.

A. Smithii Syme.—II. Bridgerule. IV. Okehampton.

Rumex nemorosus Schrad.—b. *sanguineus*. I. Between Poughill and Bude, in considerable quantity.

R. pulcher L.—I. Cliffs at Boscastle.

R. pratensis M. & K.—I. Near Launcells. II. Bridgerule, by Canal. III. Bridgerule and Pyworthy, rather frequent. IV. Okehampton. New record for N. Devon.

Polygonum lapathifolium L.—I. Roadside near Burrow. II. and III. Bridgerule. IV. Okehampton.

P. Bistorta L.—III. Bridgerule, by a tiny streamlet in "Church Meadow," in fair quantity. I suppose only naturalized.

Parietaria diffusa Koch.—I. Tintagel. II. St. Stephen's. IV. Okehampton. Certainly uncommon or (as in the Teign Basin) very local.

Humulus Lupulus L.—I. Between Stibb and Sandymouth. Near Bude. Marhamchurch. Hollow east of Stratton. Boscastle. Possibly native in one or two of these stations, though as a rule suspiciously near house or garden. II. Bridgerule, near the village. III. Bridgerule, Churchyard hedge and in the road near. IV. Okehampton and Sticklepath.

Ulmus suberosa Ehrh.—II. and III. Bridgerule. I think only denizen.

U. montana Sm.—I. Near Bude. IV. Okehampton.

Quercus Robur L., c. *sessiliflora*.—I. Stratton and Marhamchurch Road. II. Between canal and river north of Bridgerule. III. Fields about Bridgerule Bog, in plenty. Apparently very local, a. *pedunculata* being the common form.

Betula alba L.—I. II. III. All three forms seem common. IV. Okehampton (a. *verrucosa*).

Myrica Gale L.—III. Bridgerule Bog, in plenty. New record for N. Devon.

Populus tremula L.—I. Near Launcells; Tackbear Lane. II. Whitstone. III. Bridgerule and Pyworthy. Rather frequent as a hedge-bush, and apparently native.

Salix triandra L.—III. Bridge Moor, one tree.

S. repens L.—I. Between Wainhouse Corner and Tresparrot. II. and III. Bridgewater, frequent. I have observed no other species except *cinerea*, *aurita*, *caprea*, and (I think) *alba*. *Cinerea* and *aurita* are both common.

Typha latifolia L.—II. By canal, near Littlebridge, and south of Bridgerule.

Sparganium ramosum Huds.—I. II. III. Common.

Lemna minor L.—I. II. III. Common.

Potamogeton natans L.—III. Pools in Tatson Lane, and Hockin's Moor Plantation, Bridgerule.

P. polygonifolius Pour.—I. Between Wainhouse Corner and Tresparrot. III. Bridge Moor. IV. Okehampton. New record (as segregate) for N. Devon.

P. crispus L.—II. Canal at Bridgerule, in plenty. III. Bridgerule Mill-stream. Not in 'Topographical Botany' for either vice-county; but it is found (without special localities) in Dr. Hind's list, and Mr. Briggs (Journ. Bot., 1882, p. 237) has recorded it from St. Kew, in E. Cornwall.

P. pusillus L.—II. Canal at Bridgerule. III. Bridgerule Mill-stream.

(To be continued.)

TWO NEW BERMUDAN PLANTS.

By W. B. Hemsley, A.L.S.

With the exception perhaps of the Palms, which are at present imperfectly known, the following are the only probably endemic flowering plants in the Bermudas. I say probably endemic, because I think it equally probable that these forms may occur on the American continent, or in the West Indies, as well as in the Bermudas. In this poverty of the endemic element the vegetation of the Bermudas finds a parallel in the flora of the Azores.

Erigeron Darrellianus, n. sp. — Perennis, habitu foliisque *Conyza ivularis*, a qua differt capitulis radiatis minoribus numerosioribus, &c.—*Herba* perennis, ut videtur 1–2 ped. alta, basi lignosa, caulibus basi simplicibus, floriferis basi ex foliatis, superne graciliter corymboso-paniculatis. *Folia* sessilia, confertissima, membranacea, oblongo-lanceolata vel oblanceolata, usque ad 3 poll. longa, apiculata, integra vel utrinque pauci apiculato-dentata, undique sparse pilosula, superiora gradatim minora, discreta. *Capitula* numerosissima, 3–4 lineas diametro; involucri bracteæ circiter 3 seriatæ, inæquales, lineares, margine scariosæ; ligulæ 30–35, 2-seriatæ (?) angustissimæ, bracteas 1–2 lineas superantes. *Achenia* (matura desunt) sparse pilosula; pappi setæ pauci-seriatæ, hispidulæ.—In rupibus maritimis Bermudæ, *Lefroy; Moseley*.

This *Erigeron* is in habit a very distinct species; but it may have acquired its distinctive character from its habitat in the islands in a comparatively short period. In habit, foliage, and even achenes, it bears so strong a resemblance to the Brazilian *Conyza rivularis* Gardn. that I could not resist the comparison. Of course the decided ray, as the genera are limited, would stamp it as an *Erigeron*.

The name of the Hon. J. H. Darrell has been associated with this plant as an acknowledgment of the service rendered to Botany in his communications to Sir J. H. Lefroy. Mr. Darrell is a native of the islands, and the oldest inhabitant; and he has recorded some useful information respecting the introduction of certain plants, not only of facts within his own memory, but also of others transmitted from his father.

Statice Lefroyi, n. sp.—*S. Bahusiensi* affinis, differt scaporum multo elatiorum ramulis gracillimis rectiusculis bracteis floribusque triente parte brevioribus, &c.—*Herba* glabra, siccitate pallida, saltem bipedalis.—*Folia* oblonga, lanceolata vel oblanceolata, apice obtusissima vel rotundata, sub apice mucrone recto rigidiusculo instructa, basi in petiolum longissimum decurrentia, distincte pennivenia, cum petiolo 6–12 poll. longa. *Scapus* bipedalis, fistulosus, parte inferiore, saltem in siccis, angulatus, anguste ramoso-paniculatus, ramulis ultimis filiformis fere rectis; spiculæ dissitæ, 1–2 floræ, cum calyce circiter 3 lineas longæ; bracteæ late scarioso-hyalinæ, vix acutæ, extima $\frac{3}{4}$ lineam longa, intima $2\frac{1}{2}$ lineas longa. *Flores* cærulei; calycis tubus costatus, costis sat setulosis; limbi lobis subacutis; petala ima basi tantum coalita, spatulata, emarginata; filamenta leviter dilatata; ovarium glabrum, 5-angulatum, stylis a basi liberis. — In salsuginosis Walsingham Bermudæ, *Lefroy*.

This is probably the same plant identified as *Statice Caroliniana* Nutt. by Dr. J. Rein. What the true *S. Caroliniana* Nutt. is I am not able to define; but the Bermudan plant is quite distinct from anything I have seen from North America. Its nearest affinity is with *S. Bahusiensis*, from which it is distinguishable at a glance, though the technical characters that separate the species are slight. The differences are chiefly in the habit and stature of the plant, the mode of branching of the panicle, the slenderness and straightness of the ultimate branchlets, the size of the spikelets, and the size, consistence, and shape of the bracts. Dr. Asa Gray regards all the eastern coast forms of *Statice* as belonging to *S. Limonium*, whilst Chapman retains *S. Caroliniana* as a distinct species, following in this M. Boissier in his monograph in DeCandolle's 'Prodromus.' I think myself there are two species represented by the eastern North American specimens I have seen. General Sir J. Henry Lefroy was formerly Governor of the Bermudas, and during his governorship he collected a considerable number of wild plants that we have seen from no other source, to say nothing of the important historical works connected with the islands that he has edited.

ON *SPHÆRELLA* AND ITS ALLIES.

By M. C. Cooke, M.A., LL.D.

(Continued from page 71).

Sub-genus II.—Sphærella genuina.

Sporidia uniseptate.

3*__Sphærella aquatica__ Cke. Rav. Amer. Fungi, No. 690.—Hypophylla. Peritheciis globosis, atro-brunneis, in maculas orbicularos dense stipatis, primo cuticulâ tectis, demum emergentibus. Ascis clavato-cylindricis. Sporidiis elongato-ellipticis, uniseptatis, hyalinis (·02 × ·004 mm.).

On leaves of *Quercus aquatica*. Darien, Georgia.

6*Sphærella succinea Rob. in Desm. Exs. No. 1794.—Sporidia ·01 mm. long and about half as broad.

On oak leaves.

There is no more reason for transferring this species to another genus, than there would be for the transfer of *Sphærella Typhæ* Lasch., the departure from the strictly typical form being analogous. Without an index, and with such a loose interpretation of generic characters it is impossible to know where to look for it in the 'Sylloge.'

9*Sphærella Phellos (Schw.) Cke.; *Sphæria Phellos* Schw. No. 1805.—Hypophylla. Peritheciis, paucis sparsim in macula griseo-fusca aggregatis, pagina aversa innatis, prominulis subglobosis, minutis, nigris, pertusis. Ascis clavatis. Sporidiis arcte ellipticis, uniseptatis, hyalinis (·008—·01 × ·0025 mm.).

On leaves of *Quercus Phellos*. South Carolina, North America.

17*__Sphærella Podocarpi__ Cooke. — Amphigena. Peritheciis numerosis, atris, epidermide tectis. Ascis cylindrico-clavatis. Sporidiis elongato-ellipticis uniseptatis, hyalinis (·012 × ·003 mm.).

On leaves of *Podocarpus*. Java (Kurz).

Often the perithecia occupy the entire surface of the leaf.

18. __Sphærella Taxodii__ Cke. in Rav. Fungi Amer., No. 686.—Amphigena. Peritheciis sparsis, subprominulis, atris (·13 mm. diam.) poro pertusis. Ascis cylindricis. Sporidiis arcte ellipticis, uniseptatis, hyalinis (·008 × ·0025 mm.).

On leaves of *Taxodium distichum*. South Carolina, N. America.

22*__Sphærella Prini__ Cke. Rav. Amer. Fungi, No. 753. Epiphylla, sparsa, vel tota pagina occupans. Peritheciis semi-innatis, prominulis, atris. Ascis clavatis, sessilibus. Sporidiis minutissimis, arcte ellipticis, utrinque obtusis, uniseptatis, hyalinis (·005 × ·0018 mm.).

On leaves of *Prinos glaber*. S. Carolina.

Perithecia 0·1 to 0·14 mm. diam.

38*__Sphærella platanifolia__ Cke.—Hypophylla, sparsa. Peritheciis exiguis, atris, semi-immersis, punctiformibus. Ascis clavatis, sessilibus. Sporidiis biseriatis, subellipticis, uniseptatis, hyalinis, loculo inferiore tenuiore (·008 × ·004 mm.).

On leaves of *Platanus occidentalis*. Georgia, U.S. Rav. Amer. Fungi, No. 756.

Spermatia *Septoria plantanifolia* Rav. Fungi Amer., No. 27.

42*Sphærella incanescens Schwz., No. 1796. — Maculis incanescentibus, latis effusis, indeterminatis, quasi pruinatis, insident perithecia punctiformis subglobosa, minutissima, nigra, demum evacuata, sæpe quasi truncata aut collapsa. Ascis cylindricis. Sporidiis ellipticis, uniseptatis hyalinis (·008 × ·003 mm.).

On leaves of *Tilia*. U. S.

From original specimen derived from Schweinitz.

54*Sphærella populifolia Cke. Rav. Amer. Fungi, No. 689.— Hypophylla. Peritheciis innato-prominulis, punctiformibus, globosis, nigris, in maculas minutas crebras dense aggregatis, vel sparsis. Ascis cylindricis. Sporidiis sublanceolatis, uniseptatis hyalinis (·016–·018 × ·0035–·004 mm.).

On leaves of *Populus angulatus*. Aiken, S. Carolina.

64*Sphærella Fraxinicola (Schw.) Cke.; *Sphæria fraxicola* Schwz., No. 1787. — Hypophylla. Peritheciis subinnatis, nigris, demum fissis orificio, longitudinaliter difformibus, paucis tantum conjunctis maculam atram efficientibus minorem, maculis quasi confluentibus inter se. Ascis clavatis, abbreviatis. Sporidiis inordinatis, subellipticis, uniseptatis, hyalinis, loculo inferiore tenuiore (·0075 × ·003 mm.).

On leaves of *Fraxinus americana*. Darien, Georgia.

64**Sphærella effigurata Schwz., No. 1790.—Maculis longe lateque effusis, nigro-cinerascentibus, ambitu determinatum effigurato, et ob frequentiam perithecioram in margine quasi nigrocincto, sæpe totum folium in pagina aversa occupans. Peritheciis innumeris, minutis, accumulatis in his maculis, astomis, subinnatis, convexulis, nigris valde invicem approximatis, et crusta cinerascenti quasi inter se connexis. Ascis clavatis. Sporidiis ellipticis, uniseptatis, vix constrictis, hyalinis (·015 × ·004 mm.).

On leaves of *Fraxinus acuminatus*, &c. N. America.

65*Sphærella oleina Cke. Rav. Amer. Fungi, No. 754.— Epiphylla. Maculis albidis, suborbicularibus, demum confluentibus, rubromarginatis. Peritheciis minimis, punctiformibus, vix prominulis, atris, hinc illic subcircinatis. Ascis clavato-cylindricis. Sporidiis ellipticis, uniseptatis, hyalinis, leniter constrictis (·012 × ·004 mm.).

On leaves of *Olea americana*. Darien, Georgia.

Spermatia = *Phyllosticta oleina* Cke.

65**Sphærella Chionanthi B. & Br., Ceylon Fungi, No. 1114; Herb. Berk., No. 9967; *Didymella Chionanthi* Sacc. Syll., No. 2143. —Peritheciis minutis, punctiformibus, fuscis, epidermide hyalina tectis, in maculas flavidas collegit. Ascis cylindrico-clavatis. Sporidiis fusiformibus, uniseptatis, hyalinis (·018 × ·005 mm.).

On living leaves of *Chionanthus zeylanica*. Ceylon.

Never occurring on branches, as stated by Saccardo, but on the under surface of the green leaves.

68. Sphærella nitidula (Lev.) Sacc. Syll., No. 1886. — According to specimen from Leveillé himself, this is a convex black shining *Dothidea*, like so many others found in tropical countries, and has no affinity with *Sphærella*. It is similar to *Sphæria drymidis* Lev.

74*__Sphærella Rhododendri__ Cke. — Epiphylla. Perithe-ciis semi-innatis, nitidis, atris, demum asperato-prominulis, in maculas irregularas congestis. Ascis cylindricis. Sporidiis arcte ellipticis, uniseptatis, rectis, utrinque obtusis, hyalinis (·01–·012 × ·0025 mm.).

On fading and dead leaves of *Rhododendron*. Forden (Britain).

79. SPHÆRELLA COLORATA Peck. (Sacc. Syll., No. 1897).—There cannot be the slightest doubt of this being the ascigerous condition of the *Depazea Kalmicola* of Schweinitz. The stylosporous state, or *Phyllosticta Kalmicola*, is the form represented by the authentic specimens, therefore the adoption of another specific name is perhaps justifiable. Specimens of *Septoria Kalmiæ* Cke. & Ellis, from New Jersey, called *Septoria Kalmiæcola* Schwein., do not correspond to anything we know amongst the descriptions and specimens of Schweinitz, and therefore its filiform spores are sufficient to entitle it to retain the distinct name of *Septoria Kalmiæ* C. & E. Whether it is the stylosporous condition of *Sphærella* (*Læstadia*) *hæmatodes* B. & C. is open to doubt.

79*__Sphærella Gardeniæ__ Cke. — Hypophylla. Perithe-ciis sparsis, punctiformibus, semi-innatis, atris. Ascis clavatis. Sporidiis inordinatis, elongato-ellipticis, uniseptatis, hyalinis (·012 × ·0035 mm.).

On leaves of *Gardenia florida*. S. Carolina.

Spermatia = *Phyllosticta Gardeniæ* Cke.

81*__Sphærella lenticula__ Cke., Rav. Amer. Fungi, No. 800.—Hypophylla. Peritheciis globosis, atris, in pustulas elevatas, lenticulas dense stipatis (circ. 1 mm. diam.). Ascis breviter clavatis. Sporidiis inordinatis, ellipticis, uniseptatis, hyalinis (·008–·009 × ·003–·0035 mm.).

On leaves of *Cerasus Caroliniana*. S. Carolina.

87*SPHÆRELLA DENDROIDES Schwz., Syn. Car., No. 221. — Epiphylla, aggregata, astoma, maculas maximas cinereas den-droides exhibens. Peritheciis nigris erumpentibus. Ascis saccatis, late clavatis. Sporidiis lanceolatis, uniseptatis, hyalinis, loculo inferiore paulo tenuiore, leniter constrictis (·023–·025 × ·004 mm.).

On leaves of *Carya*. N. America.

This species has been confounded with *Sphæria myriadea*, from which it is evidently distinct.

90*__Sphærella Liriodendri__ Cke. — Epiphylla. Maculis orbicularibus, brunneis (1 cm.). Peritheciis subinnatis, puncti-formibus, atris. Ascis clavato-cylindricis. Sporidiis ellipticis, uniseptatis, hyalinis (·016 × ·005 mm.).

On leaves of *Liriodendron Tulipifera*. Darien, Georgia.

Stylospores, *Phyllosticta Liriodendri* Cooke, which is probably *Depazea Tulipiferæ* Schwz., No. 1822.

94*SPHÆRELLA CORNIFOLIA (Schwz.) Cke., Rav. Amer. Fungi, No. 681. *Sphæria Corni* Schw., No. 1792.—Hypophylla. Maculas effor-mans, maximas orbiculatas ambitu indeterminatas—affinis *S. effigu-ratæ*. His densim aggregatæ sunt cæspites trium aut quatuor peri-theciorum punctiformium absque ulla crusta, inter se distantes sed frequentes in eadem macula. Peritheciis ipsis astomis, innatis,

evacuatis, extus punctatis. Ascis clavatis, abbreviatis. Sporidiis ellipticis, biseriatis, hyalinis, uniseptatis (·005 × ·002 mm.).

On *Cornus florida* leaves. S. Carolina (Rav. Fung. Amer., No. 688).

Perithecia ·06–·08 mm. diam.

99*Sphærella Drymidis (Berk.); *Sphæria Drymidis* Curr., Linn. Trans., xxii., p. 333. — Epiphylla. Maculis determinatis, albis, orbicularibus, depressis. Peritheciis minutis, atris, semi-innatis. Ascis cylindricis. Sporidiis ellipticis, uniseptatis, loculo inferiore tenuiore, hyalinis (·012 × ·004 mm.).

On *Drymis*. Juan Fernandez.

102*Sphærella nigredo Schwz., No. 1799. — Hypophylla, vix innata, aggregata aut peritheciis accumulatis, majusculis pro ratione, atris rugosis, papillatis, gaudens. Ostiolis papillæformibus subapertis. Passim solitaria. Ubi aggregata sunt perithecia sæpe crusta pulveracea cinerascente, orta ex parenchymate aspersa. Ascis clavatis. Sporidiis sublanceolatis, uniseptatis, loculis subconicis, hyalinis (·008–·01 × ·003 mm.).

On leaves of *Rhus glabra*. N. America.

102**Sphærella Pistaciæ Cke. — Hypophylla. Peritheciis semi-immersis, atris, nitidis, paucis in cæspitulis aggregatis (6–10). Ascis clavato-cylindricis. Sporidiis subellipticis, uniseptatis, loculis æqualibus, hyalinis.

On leaves of *Pistacia vera*. Marseilles (Roux).

105*Sphærella Gordoniæ Cke. — Hypophylla. Peritheciis sparsis tectis, vix visibilis. Ascis subclavatis. Sporidiis inordinatis, ellipticis, uniseptatis, hyalinis (·01 × ·004 mm.) medio vix constrictis.

On leaves of *Gordonia Lasianthus*. Darien, Georgia.

Inadvertently published in Ravenel's 'Fungi Americani,' No. 799, under the name of "*Sphærella Gardeniæ*, on *Gardenia*," instead of "*Sphærella Gordoniæ*, on *Gordonia*."

107*Sphærella hæmatites (Rob.); *Didymella hæmatites* Sacc., Syll., No. 2159. — Sporidia uniseptate, hyaline (·018–·02 × ·005 mm.).

On *Clematis Vitalba* twigs.

Either this belongs to *Sphærella*, or there is no difference between *Didymella* and *Sphærella;* and the sooner one of them is abolished as useless the better.

125*Sphærella hypericina Ellis, Bullet. Torr. Bot. Club., ix., p. 74. — Amphigena. Peritheciis exiguis, erumpentibus, hinc illic 2–6 aggregatis. Ascis oblongis. Sporidiis inordinatis, clavato-oblongis, uniseptatis, plerumque curvulis, hyalinis (·01 × ·003 mm.).

On leaves of *Hypericum prolificum*. N. America.

166*Sphærella Oxalidis Kirsch. in Lotos, 1856, 203; Berk. & Br., Ceylon Fungi, No. 1122.

On *Oxalis corniculata*. Ceylon.

Sporidia uniseptate (·01–·012 mm.).

This is referred to *Læstadia oxalidis* (No. 1635) by Saccardo; but it is quite a different species, as will be evident from a comparison of the diagnosis in 'Lotos,' and the description No. 1635.

It approaches more closely to *Sphærella depazeæformis*, No. 1984. Whether all three may be forms of one species will be matter of opinion.

(To be continued.)

SHORT NOTES.

Cephalozia Turneri Hook. in North Wales. — Recently, in looking over my first collection of hepatics, made at Dolgelly, North Wales, March, 1875, I found associated with other species this rare and beautiful one. According to Dr. Spruce's memoir 'On Cephalozia,' this species has only previously been found in the South-west of Ireland; Bantry (Miss Hutchins); Cromaglown (S. O, Lindberg). England: Sussex, Tilgate Forest (Edw. Jenner, May, 1842; G. Davies, 1879). France, Canary Isles, and Africa. — W. H. Pearson.*

Agrostis nigra With. — Wishing to have the opinion of that eminent botanist, Prof. Hackel, of St. Poelten, on the *Agrostis nigra* With., noticed in this Journal for 1882 (pp. 65, 66; tab. 227), I recently sent him specimens of the plant, together with typical specimens of *A. vulgaris* and *A. alba*. A few days since I received a very courteous reply from Prof. Hackel, and, as his remarks on these plants may possibly interest English botanists, I send the following quotation from his letter:—"I am very much obliged to you for the kindness with which you have furnished me the materials for forming a judgment of my own on the *Agrostis nigra* of your country. There is no doubt that this form is in some degree intermediate between *A. vulgaris* With. and *A. alba* L., and that it weakens the distinction between these two almost generally accepted species. But whoever will take the trouble of assembling in his herbarium as many specimens of the two species from as many stations as possible (and I may say I possess about a hundred specimens from various stations between Gibraltar and Tromsoë and the Caucasus) will find that there are many more of such intermediate forms as your *A. nigra*, though I have none in my herbarium exactly identical with it. Some specimens from the Pyrenees (*A. vulgaris*, var. *macroglossum* mihi) come very near to your plant. On the other hand, there are forms of *A. alba* with panicle-branches naked below, and spreading, even when fruit-bearing. There are only two ways of expressing the existing state of things: either we restrict the names of *A. alba* and *A. vulgaris* to the typical forms (as represented in your collection) and admit at least three or four intermediate species between the two, or we reunite all into one, which must be called *A. stolonifera* L., and distinguish its various forms as subspecies, varieties, &c. I should

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* [Mr. Pearson accompanies his note with a specimen from the Welsh locality, which has been placed in the Herbarium of the British Museum.—Ed. Journ. Bot.]

prefer the latter way, as I am inclined to consider *species* as natural groups, seldom homogeneous, but more frequently consisting of inferior rank and slighter differences, though these differences may be constant in a great number of specimens. In making out the European Festucas I made the experience that it would be quite impossible to distinguish all distinguishable and perhaps hereditary forms as species; and the genus *Agrostis* would give, I am sure, another proof of the same kind." I may state that I am able in part to corroborate the opinion of Prof. Hackel, that there are still other forms of *A. vulgaris* than the one that I have ventured to call *A. nigra* Withering, as last year I found an abundant growth of a grass intermediate between that variety and typical *A. vulgaris*, i.e., having the same habit as *A. nigra*, the same vigorous growth, but having the shorter or less prominent ligule, and only slightly-toothed glumes of *A. vulgaris*; and I also found a form of *A. alba* near Kenilworth that in the flowering state closely resembled *A. nigra*; but in the fruiting state the panicles were mostly closed, though in many instances the upper branches were closed, whilst the lower ones were open. This last differed from *A. nigra*, however, in the paler flowers, more prominent acute ligules, and very rough leaf-sheaths.—J. E. Bagnall.

Gloucestershire Aliens. — Mr. White's description (p. 86) of the little colony of aliens observed by him at Kingswood, near Bristol, is interesting from the fact that these plants seem to have held their ground for several years. In number and variety of introduced species—waifs and strays of casual origin—few counties probably exceed Gloucestershire. The splendid herbarium of that county, formed by Dr. St. Brody, and lately, I believe, presented to the Gloucester Museum, contains specimens of all such aliens met with by that gentleman—and very numerous they are. On waste ground at Sharpness Docks—fifteen miles below Gloucester—I have found, summer after summer, large numbers of foreign plants introduced with grain from different parts of Europe. Amongst them have been most of those mentioned by Mr. White, together with others—*Xanthium spinosum*, for instance, and *Bromus patulus*. At the same time, though the ground has not been enclosed or otherwise disturbed since I have known the locality, no two successive years have produced the same set of plants. *Saponaria Vaccaria*, let me say, has been plentiful one summer, but next season has given place, perhaps, to some unfamiliar Crucifer or Composite. An exception must be made for *Lepidium ruderale*,—equally, no doubt, an introduction from abroad, but one which has become permanent, and is spreading. Considering the very inconstant character of the alien flora at Sharpness, it seems curious that similar plants succeed in reproducing themselves from year to year at Kingswood, in the same county.—H. P. Reader.

NEW GENERA AND SPECIES OF PHANEROGAMS PUBLISHED IN PERIODICALS IN BRITAIN IN 1882.

The periodicals cited in the compilation of this list are:—'Botanical Magazine,' 'Garden,' 'Gardeners' Chronicle,' 'Icones Plantarum,' 'Journal of the Linnean Society of London,' and 'Pharmaceutical Journal.' New genera are indicated by a prefixed asterisk.

For the convenience of those who follow Art. 50 of the 'Lois de la Nomenclature Botanique,' we have added in square brackets the authority for the publication of certain names which are cited from the MSS. of the original describers of the species.

Acineta Hrubyana *Rchb. f.*—N. Granada. Gard. Chron. xviii. 102.
Acrochoæe Rimanni *Rchb. f.*—Trop. Asia. Gard. Chron. xvii. 796.
Æchmea brassicoides *Baker.*—British Guiana. Journ. Bot. 329.
Æ. Jenmani *Baker.*—Ib. 329.
Aerides Emericii *Rchb. f.*—Brit. India. Gard. Chron. xviii. 256.
Agave bracteosa *S. Watson* [Engelmann].—California. Gard. Chron. xviii. 776, figs. 138, 139.
Agrostis Munroana *Aitch. & Hemsl.*—Afghanistan. Journ. Linn. Soc. xix. 192.
A. subaristata *Aitch. & Hemsl.*—Afghanistan. Id. xix. 192 (pl. 29).
*Aitchisonia rosea *Hemsl.* (Rubiaceæ Pæderieæ).—Afghanistan. Id. xix. 166 (pl. 14).
Alberta isosepala *Baker.*—Madagascar. Journ. Bot. 138.
Anagallis tenuicaulis *Baker.*—Madagascar. Id. 172.
Androsace Croftii *Watt.*—Sikkim Himalaya. Journ. Linn. Soc. xx. 17 (t. 14 b.).
A. geraniifolia *Watt.*—Kumaon & Sikkim. Id. (t. 16).
A. Selago *Hook. f. & Thoms.* [Watt.]—Sikkim Himalaya. Id. p. 18. (t. 18 a).
Angelica Strattoniana *Aitch. & Hemsl.*—Afghanistan, Id. xix. 164 (pl. 13).
Anguloa dubia *Rchb. f.* "n. sp., s. hyb. (?)".—Gard. Chron. xvii. 764.
Angræcum descendens *Rchb. f.*—Id. xvii. 558.
A. fuscatum *Rchb. f.*—Madagascar. Id. xviii. 483.
Anthericum graptophyllum *Baker.*—Socotra. Id. xvii. 460.
A. Parkeri *Baker.*—Madagascar. Journ. Bot. 269.
A. tripedale *Baker.*—Madagascar. Id. 269.
Anthocleista madagascariensis *Baker.*—Madagascar. Id. 173.
Anthospermum Emirnense *Baker.*—Madagascar. Id. 139.
Anthurium longipes *N. E. Br.*—Bahia. Gard. Chron. xviii. 297.
Ardisia formosana *Rolfe.*—Formosa. Journ. Bot. 358.
Astragalus Ajfreidii *Aitch. & Baker.*—Afghanistan. Journ. Linn. Soc. xix. 157.
A. congestus *Baker.*—Afghanistan. Id. 158.
A. Hemsleyi *Aitch. & Baker.*—Afghanistan. Id.
Aster lacunarum *Aitch. & Hemsl.*—Afghanistan. Id. 168 (pl. 16).
Asteropeia densiflora *Baker.*—Madagascar. Journ. Bot. 48.

ATROPIS PUMILA *T. Kirk*.—New Zealand. Gard. Chron. xvii. 261.
AVENA OLIGOSTACHYA *Munro*. — Afghanistan. Journ. Linn. Soc. xix. 193 (pl. 30).
BARONIA TARATANA *Baker*.—Madagascar. Journ. Bot. 67.
BEGONIA CLADOCARPA *Baker*.—Madagascar. Id. 113.
B. GOEGOENSIS *N. E. Br*.—Java. Gard. Chron. xviii. 71.
B. LINEATA *N. E. Br*.—Java. Id. xviii. 199.
BEILSCHMIEDIA CHINENSIS *Hance*.—Hong Kong. Journ. Bot. 79.
BERBERIS STENOPHYLLA *Hance*.—China. Id. 257.
BESCHORNERIA TUBIFLORA *Baker*. — '*B. bracteata*, Jacobi Index Agaveen, p. 11 (solum nomen).' Bot. Mag. t. 6641.
BOEA TREUBII *H. O. Forbes*.—Sumatra. Journ. Linn. Soc. xix. 297.
BOMAREA ANDREANA *Baker*.—N. Granada. Journ. Bot. 205.
B. DIFFRACTA *Baker*.—N. Granada. Id. 206.
B. DISSITIFOLIA *Baker*.—Ecuador. Id. 208.
B. FRONDEA *Mast*.—N. Granada. Gard. Chron. xvii. 668 (fig. 102).
B. GONIOCAULON *Baker*.—Quito. Journ. Bot. 204.
B. HARTWEGII *Baker*.—Ecuador. Id. 203.
B. KALBREYERI *Baker*.—N. Granada. Id. 204.
B. LANCIFOLIA *Baker*.—Quito. Id. 203.
B. LONGIPES *Baker*.—Ecuador. Id. 204.
B. PACHYPHLEBIA *Baker*.—Ecuador. Id. 204.
B. PODOPETALA *Baker*.—Ecuador. Id. 202.
B. POLYGONATOIDES *Baker*.—Ecuador. Id. 202.
B. SHUTTLEWORTHII *Mast*.—Columbia. Gard. Chron. xvii. 76 (figs. 11 & 14).
B. VITELLINA *Mast*.—Id. xvii. 143 (fig. 26).
B. WILLIAMSIÆ *Mast*.—New Granada. Id. xviii. 553.
BROCCHINIA REDUCTA *Baker*.—British Guiana. Journ. Bot. 331.
BROUSSONETIA MONOICA *Hance*.—China. Id. 294.
BULBOPHYLLUM MANDIBULARE *Rchb. f*.—Borneo. Gard. Chron. xvii. 366.
CALADENIA LEPTOCHILA *Fitzgerald*.—S. Australia. Id. xvii. 462.
C. LOBATA *Fitzgerald*.—W. Australia. Id. 461.
C. MACROSTYLIS *Fitzgerald*.—W. Australia. Id. 462.
C. PANICULATA *Fitzgerald*.—W. Australia. Id. 461.
C. PLICATA *Fitzgerald*.—W. Australia. Id. 461.
C. RETICULATA *Fitzgerald*.—S. Australia. Id. 462.
C. TENUIS *Fitzgerald*.—W. Australia. Id. 462.
C. UNITA *Fitzgerald*.—W. Australia. Id. 461.
CALANTHE BRACTEOSA *Rchb. f*.—Samoa. Id. xviii. 712.
CALLICARPA FORMOSANA *Rolfe*.—Formosa. Journ. Bot. 358.
CATTLEYA SCHOFIELDIANA *Rchb. f*. (Orchideæ)—Gard. Chron. xviii. 808.
CAMBESSEDESIA PARAGUAYENSIS *Hook. f*.—Paraguay. Bot. Mag. t. 6604.
CAMPANULA RUDERALIS *Aitch. & Hemsl*.—Afghanistan. Journ. Linn. Soc. xix. 174.
*CAMPYLOSIPHON PURPURASCENS *Benth*.—Trop. America (Spruce 2492). Ic. Pl. 1384.
CATASETUM CHRISTYANUM *Rchb. f*.—Gard. Chron. xvii. 588.
C. PILATUM *Rchb. f*.—Venezuela. Id. xvii. 492.
CEPHALANTHUS SPATHELLIFERUS *Baker*.—Madagascar. Journ. Bot. 137.

CHIRONIA PUBESCENS *Baker*.—Madagascar. Id. 172.
CHLOROPHYTUM KIRKII *Baker*.—Gard. Chron. xvii. 108.
CHRYSOPHYLLUM PENTAGONUM *Hance*.—Hong Kong. Journ. Bot. 78.
CINNAMOMUM VALIDINERVE *Hance*.—Hong Kong. Id. 80.
CIRRHOPETALUM ORNATISSIMUM *Rchb. f.*—Gard. Chron. xviii. 424.
*CLEISTACHNE SORGHOIDES *Benth.* (Gramineæ Tristegineæ)—Zambesi and E. Indies. Ic. Pl. 1379.
CLEOME DUMOSA *Baker*.—Madagascar. Journ. Bot. 18.
CLERODENDRON MAGNOLIÆFOLIUM *Baker*.—Madagascar. Id. 243.
CŒLOGYNE BIRMANICA *Rchb. f.*—Gard. Chron. xviii. 840.
COLA NATALENSIS *Oliv.*—Natal. Ic. Pl. 1390.
CONVOLVULUS AITCHISONI *Clarke*. — Afghanistan. Journ. Linn. Soc. xix. 179.
CONYZA BELLIDIFOLIA *Baker*.—Madagascar. Journ. Bot. 169.
COUSINIA APTERA *Aitch. & Hemsl.* — Afghanistan. Journ. Linn. Soc. xix. 170.
C. CARTHAMOIDES *Aitch. & Hemsl.*—Afghanistan. Id. 171 (pl. 17).
C. ELEGANS *Aitch. & Hemsl.*—Afghanistan. Id. 172 (pl. 18).
C. SCALA *Aitch. & Hemsl.*—Afghanistan. Id. 172.
CORYDALIS PULCHELLA *Aitch. & Hemsl.*—Afghanistan. Id. 151 (pl. 4).
*CRASPEDORACHIS AFRICANA *Benth.* (Gramineæ Chlorideæ).—Zambesi. Ic. Pl. 1377.
CRASSULA MONTICOLA *N. E. Br.*—S. Africa (Macowan, 960). Gard. Chron. xviii. 264.
CRINUM NORTHIANUM *Baker*.—Borneo. Id. xvii. 671.
CROTON MYRIASTER *Baker*.—Madagascar. Journ. Bot. 268.
C. PLATANIFOLIUS *Baker*.—Madagascar. Id. 268.
CYPERUS GLANDULOSUS *Rolfe*.—E. African Islands. Id. 362.
*CYPHOSTIGMA PULCHELLUM *Benth.* (*Amomum pulchellum* Thwaites; Scitamineæ Zingibereæ). — Ceylon. Thwaites C. P. 2736. Ic. Pl. 1380.
CYPRIPEDIUM CILIARE *Rchb. f.*—Philippines. Gard. Chron. xviii. 488.
C. NIGRITUM *Rchb. f.*—Borneo. Id. xviii. 102.
C. RETICULATUM *Rchb. f.*—Id. xviii. 520.
CYRTOSPERMA JOHNSTONI *N. E. Br.* — *Alocasia Johnstoni* Hort. (Aroideæ). Solomon Isles. Id. xviii. 808.
CRYPTOCARYA CONCINNA *Hance*.—Hong Kong. Journ. Bot. 79.
*CRYPTOCHLORIS SPATHACEA *Benth.* (Gramineæ Chlorideæ).—"Most probably Patagonia." Ic. Pl. 1376.
CUPANIA ISOMERA *Baker*.—Madagascar. Journ. Bot. 51.
DALBERGIA HUPEANA *Hance*.—China. Id. 5.
DANAIS CORNUA *Baker*.—Madagascar. Id. 137.
DENDROCHILUM ARACHNITES *Rchb. f.*—Philippines. Gard. Chron. xvii. 256.
DENDROBIUM CHRISTYANUM *Rchb. f.*—Siam. Id. xvii. 178.
D. DEAREI *Rchb. f.*—Id. xviii. 361.
D. HUGHII *Rchb. f.*—Singapore. Id. xvii. 764.
D. INOPUS *Rchb. f.*—Birmah? Id. xviii. 808.
D. LEUCOLOPHOTUM *Rchb. f.*—Sunda. Id. xviii. 552.
D. LINGUELLA *Rchb. f.*—Malaya. Id. xviii. 552.
D. LUBBERSIANUM *Rchb. f.*—Birmah. Id. xvii. 460.

D. MACFARLANEI *Rchb. f.*—New Guinea. Id. xviii. 520.
D. PLEIOSTACHYS *Rchb. f.*—New Guinea. Id. xviii. 520.
D. RIMANNI *Rchb. f.*—Moluccas. Id. xviii. 680.
D. VANDIFLORUM *Rchb. f.*—New Guinea. Id. xviii. 520.
DICORYPHE BUDDLEOIDES *Baker.*—Madagascar. Journ. Bot. 111
DIDYMOCARPUS SCHEFFERI *H. O. Forbes.*—Borneo. Journ. Linn. Soc. xix. 298.
DIOSCOREA BUCHANANI *Benth.*—Zambesi. Ic. Pl. 1398.
D. HETEROPODA *Baker.*—Madagascar. Journ. Bot. 270.
D. HEXAGONA *Baker.*—Madagascar. Id. 270.
D. OVINALA *Baker.*—Madagascar. Id. 269.
D. SWINHOEI *Rolfe.*—Formosa. Id. 359.
DIURIS LŒRTIS *Fitzgerald.*—W. Australia. Gard. Chron. xvii. 495.
DOMBEYA MODESTA *Baker.*—Madagascar. Journ. Bot. 47.
DRAKÆA GLYPTODON *Fitzgerald.*—W. Australia. Gard. Chron. xvii. 494.
*DYERA COSTULATA *Hook. f.* (Apocyneæ).—(*Alstonia ? costulata* Miq.). Malaya. Journ. Linn. Soc. xix. 293.
D. LOWII *Hook. f.*—Malaya. Id.
EPIDENDRUM CINGILLUM *Rchb. f.*—Gard. Chron. xvii. 330.
ERIA RHODOPTERA *Rchb. f.*—Gard. Chron. xviii. 586.
EUCHARIS SANDERI.—Gard. Chron. xviii. 712.
EUGENIA CONDENSATA *Baker.*—Madagascar. Journ. Bot. 112.
E. CYCLOPHYLLA *Baker.*—Madagascar. Id. 111.
E. TANALENSIS *Baker.*—Madagascar. Id. 111.
EUONYMUS GIBBER *Hance.*—Hong Kong. Id. p. 77.
EUPATORIUM CINEREUM *Baker.*—Brazil. Id. 226.
EVODIA MADAGASCARIENSIS *Baker.*—Madagascar. Journ. Bot. 48.
GAERTNERA OBOVATA *Baker.*—Madagascar. Id. 218.
*GAMOGYNE BURBIDGEI *N. E. Br.* (Aroideæ).—Borneo. Id. 196.
*GEARUM BRASILIENSE *N. E. Br.* (Aroideæ).—Brazil. Id. 196 (t. 231).
GENTIANA MICRANTHA *Aitch. & Hemsl.*—Afghanistan. Journ. Linn. Soc. xix. 177 (pl. 9).
GLOBBA ALBOBRACTEATA *N. E. Br.*—Sumatra (Beccari 208). Gard. Chron. xviii. 71.
GLOSSODIA INTERMEDIA *Fitzgerald.*—W. Australia. Id. xvii. 462.
*GORCEIXIA DECURRENS *Baker* (Compositæ Vernoniaceæ).—Brazil. Journ. Bot. 225 (t. 232).
GOSSYPIUM KIRKII *Mast.*—Trop. Africa. Journ. Linn. Soc. xix. 214.
GRAMMATOPHYLLUM ELEGANS *Rchb. f.*—Oceania. Gard. Chron. xviii. 776.
GREWIA CALVATA *Baker.*—Madagascar. Journ. Bot. 48.
G. GRANDIFLORA *Baker.*—Madagascar. Id. 47.
G. TRINERVATA *Baker.*—Madagascar. Id. 47.
GYMNOSPORIA BRACHYSTACHYA *Baker.*—Madagascar. Id. 50.
G. DIVARICATA *Baker.*—Madagascar. Id. 49.
HEDYOTIS LONGIDENS *Hance.*—China. Id. 289.
HELICHRYSUM CONCRETUM *Baker.*—Madagascar. Id. 170.
HELIETTA PARVIFOLIA *Benth.*—Mexico (Berlandier 1404 (144);) Ic. Pl. 1385.
HERACLEUM LEUCOCARPUM *Aitch. & Hemsl.*—Afghanistan. Journ. Linn. Soc. xix. 165.

H. PROPINQUUM *Aitch. & Hemsl.*—Afghanistan. Id. 165.
HIBISCUS OCHROLEUCUS *Baker.*—Madagascar. Journ. Bot. 46.
H. PARKERI *Baker.*—Madagascar. Id. 46.
H. STENOPHYLLUS *Baker.*—Madagascar. Id. 47.
HOMALIUM TETRAMERUM *Baker.*—Madagascar. Id. 110.
HUERNIA OCULATA *Hook. f.*—Dammara Land. Bot. Mag. t. 6658.
ILYSANTHES OBLONGIFOLIA *Baker.*—Madagascar. Journ. Bot. 221.
IMPATIENS BARONI *Baker.*—Madagascar. Id. 49.
I. SULTANI *Hook. f.*—Zanzibar. Bot. Mag. t. 6643. Garden xxii. 208, t. 352.
INDIGOFERA STENOSEPALA *Baker.*—Madagascar. Journ. Bot. 68.
INULA RUPESTRIS *Aitch. & Hemsl.*—Afghanistan. Journ. Linn. Soc. xix. 168.
I. SHIRENSIS *Olio.*—Zambesi. Ic. Pl. 1399.
ISOPYRUM UNIFLORUM *Aitch. & Hemsl.*—Afghanistan. Journ. Linn.
JASMINUM MESNYI *Hance.*—China. Journ. Bot. 37.
KÆMPFERIA VITTATA *N. E. Br.*—Sumatra. Gard. Chron. xviii. 264.
KALANCHOE ORGYALIS *Baker.*—Madagascar. Journ. Bot. 110.
K. SYNSEPALA *Baker.*—Madagascar. Id. 110.
K. TOMENTOSA *Baker.*—Madagascar. Id. 110.
KOSTELETSKYA MADAGASCARIENSIS *Baker.*—Madagascar. Id. 46.
LEEA AMABILIS *Hort. Veitch.* [Mast.].—Borneo. Gard. Chron. xvii. 492 (fig. 77).
LIGUSTRUM MOLLICULUM *Hance.*—China. Journ. Bot. 291.
LIMONIA TRICHOCARPA *Hance.*—China. Id 258.
LIMNOPHILA TORENIOIDES *Baker.*—Madagascar. Id. 221.
LINUM BETSILIENSE *Baker.*—Madagascar. Id. 48.
LORANTHUS BARONI *Baker.*—Madagascar. Id. 266.
L. MICROCUSPIS *Baker.*—Madagascar. Id. 245.
L. PACHYPHYLLUS *Baker.*—Madagascar. Id. 245.
MALLOTUS CONTUBERNALIS *Hance.*—China. Id. 293.
MASCARENHASIA CURNOWIANA *Hemsl.*—Madagascar. Garden xxi. p. 98, t. 323. Bot. Mag. t. 6612.
M. MACROCALYX *Baker.*—Madagascar. Journ. Bot. 219.
MASDEVALLIA ERYTHROCHŒTE *Rchb. f.*—Central America. Gard. Chron. xviii. 392.
M. HIEROGLYPHICA *Rchb. f.*—New Granada. Id. xviii. 230.
M. LUDIBUNDA *Rchb. f.*—New Granada. Id. xvii. 179.
M. PLATYGLOSSA *Rchb. f.*—Id. xviii. 552.
M. TRICOLOR *Rchb. f.*—New Granada. Id. xviii. 102.
M. UROSTACHYA *Rchb. f.*—Id. xvii. 765.
MAURANDIA ERECTA *Hemsl.*—Mexico. Id. xvii. 22.
MAZUS CADUCIFER *Hance.*—China. Journ. Bot. 292.
MELICA GRACILIS *Aitch. & Hemsl.*—Afghanistan. Journ. Linn. Soc. xix. 192.
MESEMBRYANTHEMUM BOLUSII *Hook. f.*—Grahamstown. Bot. Mag. t. 6664.
MICROMERIA MADAGASCARIENSIS *Baker.*—Madagascar. Journ. Bot. 244.
MILLETTIA SERICOSEMA *Hance.*—China. Id. 259.
MODECCA DENSIFLORA *Mast.*—Madagascar. Id. 112.
MUNDULEA PAUCIFLORA *Baker.*—Madagascar. Id. 68.

MUSSÆNDA HYMENOPOGONOIDES *Baker*.—Madagascar. Id. 138.
NEPENTHES BURBIDGEÆ *Hook. f.* MSS. [*Burbidge*].—Borneo. Gard. Chron. xvii. 56.
NEPETA PINETORUM *Aitch. & Hemsl.*—Afghanistan. Journ. Linn. Soc. xix. 183.
NIEBUHRIA WOODII *Oliv.*—Natal. Ic. Pl. 1386.
*NOTOBUXUS NATALENSIS *Oliv.* (Euphorbiaceæ Buxeæ).—Natal. Id. 1400.
NUXIA CAPITATA *Baker*.—Madagascar. Journ. Bot. 172.
OCHNA POLYCARPA *Baker*.—Madagascar. Id. 49.
ODONTOGLOSSUM ACUMINATISSIMUM *Rchb. f.* "(n. sp. (?) hybr. (?)."—Gard. Chron. xvii. 236.
O. MARGINELLUM *Rchb. f.*—Id. xviii. 680.
O. MIRANDUM *Rchb. f.*—New Granada. Id. xvii. 143.
O. SANDERIANUM *Rchb. f.*—Id. xvii. 492.
OMPHALEA CARDIOPHYLLA *Hemsl.*—Central America (S. Hayes, 617). Pharm. Journ. 3rd S. xiii. 301.
O. OLEIFERA *Hemsl.*—Central America. Id.
ONCIDIUM MELIOSMUM *Rchb. f.*—Gard. Chron. xvii. 796.
ONOBRYCHIS LAXIFLORA *Baker*.—Afghanistan. Journ. Linn. Soc. xix. 159.
ORMOSIA SEMICASTRATA *Hance*.—Hong Kong. Journ. Bot. 78.
OXYGRAPHIS SHAFTOANA *Aitch. & Hemsl.*—Afghanistan. Journ. Linn. Soc. xix. 149 (pl. 3).
PACHYPODIUM ROSULATUM *Baker*.—Madagascar. Journ. Bot. 219.
PANICUM PABULARE *Aitch. & Hemsl.*—Afghanistan. Journ. Linn. Soc. xix. 190.
PAVONIA BOJERI *Baker*.—Madagascar. Journ. Bot. 45.
PELLIONIA PULCHRA *N. E. Br.*—Cochin China. Gard. Chron. xviii. 712.
PEPEROMIA TANTALENSIS *Baker*.—Madagascar. Journ. Bot. 244.
PHALÆNOPSIS REICHENBACHIANA *Rchb. f. & Sander*.—Tropical Asia. Gard. Chron. xviii. 256.
P. FASCIATA *Rchb. f.*—Philippines. Id. xviii. 136.
PHILIPPIA PARKERI *Baker*.—Madagascar. Journ. Bot. 171.
PHOTINIA MELANOSTIGMA *Hance*.—China. Id. 5.
PILEA CRASSIFOLIA *Hance*.—China. Id. 295.
P. HYPNOPHILA *Baker*.—Madagascar. Id. 247.
PINUS LATISQUAMA *Engelm.*—Mexico. Gard. Chron. xviii. 712 (fig. 125).
PIPER BORNEENSE *N. E. Br.*—West Borneo. Id. xvii. 108.
PIPTURUS INTEGRIFOLIUS *Baker*.—Madagascar. Journ. Bot. 267.
PLECTRANTHUS MELLERI *Baker*.—Madagascar. Id. 243.
PLEUROTHALLIS SPECTRILINGUIS *Rchb. f.*—Gard. Chron. xviii. 457.
*PODOLASIA STIPITATA *N. E. Br.* (Aroideæ).—Borneo. Id. xviii. 70.
POLYGONUM TRISTACHYUM *Baker*.—Madagascar. Journ. Bot. 224.
POLYSTACHYA DIXANTHA *Rchb. f.*—West Trop. Africa. Gard. Chron. xvii. 294.
PRASOPHYLLUM ATTENUATUM *Fitzgerald*.—W. Australia. Id. xvii. 495.
P. PLUMÆFORME *Fitzgerald*.—W. Australia. Id. xvii. 495.
P. TRIANGULARE *Fitzgerald*.—W. Australia. Id.
PRIMULA CLARKEI *Watt*.—Kashmir. Journ. Linn. Soc. xx. 4 (t. 313).
P. CONCINNA *Watt*.—Sikkim Himalaya. Id. 4 (t. 4 a).

P. DICKIEANA *Watt.*—Id. 9 (t. 8 a).
P. ELONGATA *Watt.*—Id. 8 (t. 6).
P. ELWESIANA *King* [*Watt.*].—Id. 13 (t. 12 a).
P. FILIPES *Watt.*—Bhotan. Id. 5 (t. 3 a).
P. GAMBELIANA *Watt.*—Id. 3 (t. 1).
P. HEYDEI *Watt.*—W. Tibet. Id. 5 (t. 4 c).
P. HOOKERI *Watt.*—Sikkim Himalaya. Id. 14 (t. 8 b).
P. KINGII *Watt.*—Id. 9 (t. 7).
P. MUSCOIDES *Hook. f.*—Id. 15 (t. 4 d).
P. PULCHRA *Watt.*—Sikkim Himalaya. Id. 3 (t. 2 a).
P. REPTANS *Hook. f.*—W. Himalaya. Id. 14 (t. 13 b).
P. SAPPHIRINA *Hook. f. & Thoms.*—Id. 10 (t. 13 c).
P. SOLDANELLOIDES *Watt.*—Id. 10 (t. 11 c).
P. STIRTONIANA *Watt.*—Id. 15 (t. 13 d).
P. TENELLA *King* [*Watt.*].—Chumbi Valley. Id. 13 (t. 12 b).
P. TIBETICA *Watt.*—Tibet and Sikkim. Id. 6 (t. 11 a).
P. VAGINATA *Watt.*—Sikkim Himalaya. Id. 4 (t. 2 b).
P. WATTII *King* [*Watt.*].—Id. 10 (t. 14 a).
PSEUDOCENTRUM MINUS *Benth.*—Jamaica. Ic. Pl. 1382.
*PSEUDODRACONTIUM ANOMALUM *N. E. Br.* (Aroideæ).—Cochin China. Journ. Bot. 193 (t. 231).
P. LACOURII *N. E. Br.*—Cochin China. Id. 194.
PSIADIA AURICULATA *Baker.*—Madagascar. Journ. Bot. 169.
PSOROSPERMUM ANDROSÆMIFOLIUM *Baker.*—Madagascar. Id. 19.
RANUNCULUS AFGHANICUS *Aitch. & Hemsl.*—Afghanistan. Id. xix. 148.
RAPHIDIOCYSTIS BRACHYPODA *Baker.*—Madagascar. Journ. Bot. 113.
*RHEKTOPHYLLUM MIRABILE *N. E. Br.* (Aroideæ). — Fernando Po. Id. 195 (t. 230).
RHODODENDRON MARIÆ *Hance.*—China. Id. 230.
RUBUS OCHLANTHUS *Hance.*—China. Id. 260.
R. PARKERI *Hance.*—China. Id. 260.
SACCHARUM GRIFFITHII *Munro MSS.* (nomen solum). — India. Journ. Linn. Soc. xix. 191.
SACCOLABIUM CALOPTERUM *Rchb. f.* — New Guinea. Gard. Chron. xviii. 520.
S. FLEXUM *Rchb. f.*—New Guinea. Id. xviii. 520.
SALIX BASFORDIANA *Hort.* [*Salter*].—Id. xviii. 298 (figs. 41, 42).
S. CYANOLIMENÆA *Hance.*—China. Journ. Bot. 295.
S. MESNYI *Hance.*—China. Id. 28.
SARCANTHUS STRIOLATUS *Rchb. f.* — Philippines. Gard. Chron. xviii. 168.
SAXIFRAGA MILESII *Hort. Leichtlin* [*Baker*]. — N. W. Himalayas. Id. xviii. 102.
*SCHAFFNERA GRACILIS *Benth.* (Gramineæ Zoysiæ ?)—Mexico. Ic. Pl. 1378.
SCROPHULARIA PETRÆA *Aitch. & Hemsl.*—Afghanistan. Journ. Linn. Soc. xix. 180.
SEMPERVIVUM MOGGRIDGEI *Hort. De Smet.* [*Hook. f.*]. — Maritime Alps. Bot. Mag. t. 6610.
SENECIO BETSILIENSIS *Baker.*—Madagascar. Journ. Bot. 170.
S. ERECHTHITOIDES *Baker.*—Madagascar. Id. 170.

S. FAUJASIODES *Baker*.—Madagascar. Id. 170.
SIMARUBA MONOPHYLLA *Oliv*.—British Guiana. Ic. Pl. 1387.
SOLANUM CYPHANANTHUM *Baker*.—Madagascar. Journ. Bot. 220.
S. NITENS *Baker*.—Madagascar. Id. 220.
SONCHUS PAUCIFLORUS *Baker*.—Madagascar. Id. 171.
SOPUBIA TRIPHYLLA *Baker*.—Madagascar. Id. 220.
*SOYAUXIA GABONENSIS *Oliv*. (Passifloraceæ).—Gaboon (Soyaux 48). Ic. Pl. 1393.
STAPELIA NAMAQUENSIS *N. E. Br*.—Namaqua-land. Gard. Chron. xviii. 648.
S. TSOMOENSIS *N. E. Br*.—South Africa. Id. xviii. 168.
STATICE GRIFFITHII *Aitch. & Hemsl*.—Afghanistan. Journ. Linn. Soc. xix. 175 (pl. 23).
S. VARIA *Hance*.—China. Journ. Bot. 290.
STEGOLEPIS FERRUGINEA *Baker*.—British Guiana. Id. 331.
STENOMESSON STRICKLANDI *Baker*.—Ecuadorean Andes. Gard. Chron. xviii. 102.
STEPHANANDRA CHINENSIS *Hance*.—China. Journ. Bot. 210.
STEREOSPERMUM SINICUM *Hance*.—China. Journ. Bot. 16.
SYMPHONIA CLUSIOIDES *Baker*.—Madagascar. Id. 19.
SYMPLOCOS FORDII *Hance*.—Hong Kong. Id. 78.
TABERNÆMONTANA MODESTA *Baker*.—Madagascar. Id. 219.
TACHIADENUS PLATYPTERUS *Baker*.—Madagascar. Id. 172.
TACSONIA PARRITÆ *Mast*.—Gard. Chron. xvii. 218 (fig. 34).
TAMBOURISSA PARVIFOLIA *Baker*.—Madagascar. Journ. Bot. 267.
TANACETUM FISHERÆ *Aitch, & Hemsl*.—Afghanistan. Journ. Linn. Soc. xix. 170.
TEPHROSIA LYALLII *Baker*.—Madagascar. Journ. Bot. 68.
TEUCRIUM INCANUM *Aitch. & Hemsl*.—Afghanistan. Journ. Linn. Soc. xix. 184.
THELYMITRA GRANDIFLORA *Fitzgerald*.—S. Australia. Gard. Chron. xvii. 495.
T. LUTEOCILIUM *Fitzgerald*.—S. Australia. Id.
T. MUCIDA *Fitzgerald*.—W. Australia. Id.
T. RUBRA *Fitzgerald*.—S. Australia. Id.
T. URNALIS *Fitzgerald*.—S. Australia. Id.
THRIXSPERMUM BERKELEYI *Rchb. f*.—India. Id. xvii. 557.
T. SILLEMIANUM *Rchb. f*.—Id. xvii. 524.
TRICALYSIA CRYPTOCALYX *Baker*.—Madagascar. Journ. Bot. 138.
TRICHODESMA STRICTUM *Aitch. & Hemsl*.—Afghanistan. Journ. Linn. Soc. xix. 178.
TRIODIA EXIGUA *T. Kirk*.—N. Zealand. Gard. Chron. xvii. 260.
TROCHOMERIA MADAGASCARIENSIS *Baker*.—Madagascar. Journ. Bot. 113.
TULIPA PRIMULINA *Baker*.—Algeria. Gard. Chron. xviii. 8.
TYLOPHORA MACRANTHA *Hance*.—Hong Kong. Journ. Bot. 79.
UVARIA CALAMISTRATA *Hance*.—Hong Kong. Id. 77.
URERA AMBERANA *Baker*.—Madagascar. Id. 267.
VANDA SANDERIANA *Rchb. f*.—Gard. Chron. xvii. 588.
V. VIPANI *Rchb. f*.—Burmah. Id. xviii. 134.
VANDELLIA CORYMBOSA *Baker*.—Madagascar. Journ. Bot. 221.

Veprecella schizocarpa *Baker*.—Madagascar. Id. 112.
Vernonia gratiosa *Hance*.—China. Id. 290.
V. Merana *Baker*.—Madagascar. Id. 139.
V. pectoralis *Baker*.—Madagascar. Id. 139
V. rhodolepis *Baker*.—Madagascar. Id. 139.
V. scariosa *Baker*.—Madagascar. Id. 169.
Veronica rupestris *Aitch. & Hemsl*.—Afghanistan. Journ. Linn. Soc. xix. 180 (pl. 25).
Viburnum setigerum *Hance*.—China. Journ. Bot. 261.
Vigna Angivensis *Baker*,—Madagascar. Id. 69.
V. Parkeri *Baker*.—Madagascar. Id. 69.
Viguiera wedelioides *Baker*.—Brazil. Id. 226.
Viscum cryptophlebium *Baker*.—Madagascar. Id. 245.
Vitex uniflora *Baker*.—Madagascar. Id. 221.
Vitis adstricta *Hance*.—China. Id. 258.
V. biternata *Baker*.—Madagascar. Id. 51.
V. floribunda *Baker*.—Madagascar. Id. 50.
V. Hancockii *Hance*.—China. Id. 4.
V. microdonta *Baker*.—Madagascar. Id. 50.
V. oxyodonta *Baker*.—Madagascar. Id. 50.
Webera hispidula *Baker*.—Madagascar. Id. 137.
Weinmannia lucens *Baker*.—Madagascar. Id. 70.
W. trigyna *Baker*.—Madagascar. Id. 109.
Wunderlichia Glaziovii *Baker*.—Brazil. Id. 225.
Xerochlamys pilosa *Baker*.—Madagascar. Id. 45.
Xerophyta pectinata *Baker*.—Madagascar. Id. 270.
X. sessiliflora *Baker*.—Madagascar. Id. 271.
Zephyranthes citrina *Baker*.—Trop. America. Bot. Mag. t. 6605.
Zingiber integrilabrum *Hance*.—Hong Kong. Journ. Bot. 80.

NOTICES OF BOOKS.

The Flora of Hampshire, including the Isle of Wight; or, a List of the Flowering Plants and Ferns found in the County of Southampton, with localities of the less common species. By Frederick Townsend, M.A., F.L.S., &c. London: L. Reeve and Co. 1883.

The scientific literature of one of the most beautiful and interesting of the English counties has received a valuable addition through the publication of a Flora of a first-class description. The 'Flora of Hampshire,' promised for some time past, but delayed in publication by the regretted illness of the author, has at length appeared. The amount of valuable information brought before us in the volume is immense, and does credit to the industry of the author, especially as his details are generally such as to make us wish they were fuller rather than otherwise. Of all the British county Floras with which we are familiar, this one of Hampshire most nearly resembles Trimen & Dyer's admirable one of Middlesex. The main divisions of the two works are very similar. The Intro-

duction comprises short particulars respecting the topography, climate, and geology of the county; also outlines of the twelve botanical districts, founded on the river basins, into which it is divided; a list of the principal works quoted and herbaria consulted; and an explanation and abbreviation of the signs employed. The Flora proper next occupies no less than 469 closely printed pages. The work, however, is continued up to 524 pages by notes on the districts; lists of the rare and more noteworthy plants in each district; comparison of the flora with that of the neighbouring counties; of Hampshire mainland with the Isle of Wight; comparison with Mr. Watson's sub-provinces; list of species having a certain limit in the county as compared with the rest of England; reference to M. Thurman's 'Essai de Phytostatique'; a short article on introduced plants; an Appendix of nearly a dozen pages, filled with critical remarks or valuable notes concerning some of the plants mentioned in the body of the work; four pages of additions and corrections; an alphabetical index of the orders and genera; and finally, another of the "more popular English names," brings the well-filled volume to its end. It moreover contains a good map, showing the districts.

Notwithstanding the many details and the variety of the matters dealt with, one interesting feature of the 'Middlesex Flora' is lacking, viz., a sketch of the progress of botanical investigation in the county. This is to be regretted, as a chronological notice of the contributors to the botanical literature of Hants would have been of very great interest. Particulars of their writings are, however, partly supplied by the list of the principal works quoted, which is a very full one. Considering the area of the county is about 1,032,105 acres, and that this surface is divided into 12 districts for the express purpose of tracing, so far as possible, all its plant species through them, the self-imposed task Mr. Townsend set himself to perform, and has now carried out, appears great indeed. It is true that many of his quotations of previous records have been shorn of much of their interest and some of their value through being given in the form of mere names of places instead of in the exact and fuller words of the original writers; but to have dealt otherwise with them, especially those from Dr. Bromfield's writings, would have added greatly to the size of the book and consequently to its price. If it be of importance, as we consider it is, to know the "first record" for a plant in a given tract or at a certain spot, a practice which the author says he has sometimes followed must be open to objection,—that is if we are to understand him in the following words to assert an ignoring of any *published* records of plant-stations, in addition to some unrecorded manuscript ones privately furnished by correspondents or friends: "When I have myself," says Mr. Townsend, "also seen the plant in the locality, I have, unless the record be an old one or seem to require confirmation, allowed it to rest on my own authority alone." As regards the term "first record" he tells us this may be "a printed or written one, published or unpublished; it may be the name of the finder, or of the author of a book, or it may be a dried specimen

preserved in a herbarium." We question the propriety of making "first record" cover so many sources of information, and would restrict it ourselves to some published statement, though of course this would not involve a suppression of the other particulars.

The knowledge the author possesses as a critical botanist and man of learning, together with his literary ability, make his notes and remarks valuable and attractive paragraphs for study and reflection, and we feel sure portions of the work, the 'Appendix' especially, will be read and dwelt on by many botanists besides those interested specially in the flora of Hants.

Mr. Townsend calculates the number of Hampshire species at 1114; inclusive of *Rubi*, *Characeæ*, and some other plants not reckoned by Mr. Watson in his enumeration of British species in Cyb. Brit. iv. pp. 499–519, and C. C. B. pp. 23–32. Those contained in Mr. Watson's calculation he makes 1045 against the 1425 for the whole of Britain. Three species of the "British type" are absent, *Geranium sanguineum*, *Potentilla verna*, and *Cystopteris fragilis*. The species found only in Hants are *Isnardia palustris* (formerly also in Sussex), *Gladiolus illyricus*, *Spartina alterniflora*, and the recently described *Spartina Townsendi*. Since the last pages of the work were put in type a note added to the "additions" informs us that *Ranunculus ophioglossifolius* was found sparingly in a ditch west of Hythe, by Mr. H. Groves, making an additional species peculiar to the county.* Those given as having their main range in the county, with the few plants named above, are *Mathiola incana*, *Arctium intermedium* Lange (in I. of W.), *Erythræa capitata*, *Calamintha sylvatica*, *Pulmonaria angustifolia*, and *Spiranthes æstivalis*. *Erythræa capitata* was first distinguished by Mr. Townsend, who seems to have paid particular attention to the genus to which it belongs. He names the Hampshire form, which occurs in both of the two botanical districts into which the I. of Wight is divided, var. *sphærocephala*, and says: "*Erythræa capitata* is a peculiarly interesting addition to the English Flora. It is a well marked species, and is not known now to occur anywhere else in the world but in the I. of Wight and in Sussex. The other form of it was found some fifty years ago, somewhere in the neighbourhood of Berlin (the exact locality not being known), and though sought for diligently it has never been found again." Both the typical plant and the English variety are described in the Appendix,† and two excellent plates, lithographed by Fitch, from drawings by the author, show various forms of the I. of Wight plant and enrich the work. These plates, which Mr. Townsend has kindly allowed to be used for this Journal, are issued with the present number.

Although the degree of frequency of a species in the county, as a whole, is usually given in some general way, as "common," "not uncommon," "rare," "local," &c., we miss the use of a *graduated series of terms*, like that employed in the 'Flora of Middlesex,' to indicate the *comparative* frequency of each species within the whole area.

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* See Journ. Bot. 1883, p. 51.

† See also Journ. Bot. 1881, p. 302.

A want of care to give quite accurately the periods of flowering of many species is certainly one of the defects of the book. Surely *Ranunculus Lenormandi* and *R. hederaceus* must open their flowers before June in Hants, since in Devon and Cornwall they are both in blossom in April, the former even in March. *Cochlearia danica* quickly follows *Draba verna* and *Cardamine hirsuta* in unfolding its petals, and only this spring we noticed some out before the middle of March, but under it appears "May–Aug." *Fragaria vesca*, in the South of England, begins to flower six weeks or two months before May, though its blossoms for a considerable period in the spring seem never to produce fruit. Our experience has been to find *Veronica arvensis* flowering during six months out of the twelve; so certainly its blooming season cannot really be limited to July in Hants. *Veronica Buxbaumii* will continue to open its flowers considerably later than September, even after sharp frosty mornings have occurred. *Centunculus minimus* is one of our latest annuals, as it flowers until the month of October.

The *habituts* named in the Flora cannot always have that exclusively local application desirable in a work of the kind. For instance, under *Epilobium lanceolatum* we find "walls, roadsides, and other dry places," though followed by the record of only a single station for the whole county, and this a "raised hedgebank on right-hand side of road from Liphook to Woolmer Forest." We would ourselves prefer the entire omission of statements of *habituts*, together with periods of flowering, from a local Flora, if not relating exclusively to the plants *as species of the area embraced*, and derived from careful observation therein.

We confess to having been startled at seeing some of the species inserted in the "List of plants, most of which have certainly and some probably been introduced by human agency," and we have come to the conclusion that the author's views must be peculiar on the matter. From our own point of view we should have accepted without question, as indigenous species, *Sisymbrium officinale*, *Arabis Thaliana*, *Lychnis diurna*, *Arenaria serpyllifolia*, *Malva moschata*, *Geranium molle*, *Trifolium arvense*, *Potentilla reptans*, *Carduus arvensis*, *Arctium minus*, *Inula dysenterica*, *Convolvulus arvensis*, *Mentha arvensis*, *Rumex Acetosa*, *Allium vineale*, and several others. On the other hand, we should have either placed in the list some other species, or else marked them as possibly or certainly introduced, when treating of them in the body of the work. Amongst them are *Ægopodium Podagraria* and *Silybum Marianum*. Having noticed what seem to us some blemishes in this work, we might, on the other hand, fill many pages with such valuable quotations from it as could not fail to make those reading them desirous of possessing a copy of the book for quiet perusal and study. Mr. Townsend's careful observation is apparent in the remark under *Agrimonia odorata*, "The furrows of the fruit extend to the spines," given as a mark of distinction between it and *A. Eupatoria*. The same nice observation is seen in the following extract:—"In its natural condition *Erythræa pulchella* forms an open, much-branched panicle, branched from the base. The root leaves are smaller than those

produced later, and do no not form a rosette like all our other native species." One of the paragraphs of the Appendix is on *Cerastium viscosum*, and in it Mr. Townsend tells us:—"An examination of authentic specimens of *C. glutinosum*, kindly communicated by Prof. Fries, has convinced me that his plant is identical with our *C. pusillum*." Some remarks on *Orchis incarnata*, considered in connection with the recent paper of Mr. C. B. Clarke, in Journ. Linn. Soc. xix., 206, are especially worthy of attention. We have also a description of a supposed hybrid plant, named *O. latifolio-maculata*. Under *Carex Œderi*, we find the observation, "I have never found this plant either in England or on the Continent, except on ground which has been covered by water during the winter and is left comparatively dry during summer. Thus the favourite station for *C. Œderi* is on the margins of large pools or lakes." Mr. Townsend now identifies the *Glyceria plicata*, var. *nana* of his 'Contributions to a Flora of the Scilly Isles,' with *G. declinata* Brébisson, Fl. Nom., ed. 3 and 4, and enters fully into particulars respecting it in the Appendix. We have also a description of a variety of *Sclerochloa maritima* Lind., which he has named *riparia*.*

An apparent desire to swell the number of the species for the county has led to the admission of some plants, *Orchis hircina* for instance, into its list on what would seem very slender evidence indeed.

Professor Babington's arrangement of the genus *Rubus* is the one adopted, and Mr. J. G. Baker's that for the genus *Rosa*. Mr. Townsend follows Babington in making *Rubus ramosus* Blox., identical with, or a variety of, *R. imbricatus* Hort. We, however, feel confident the two are as distinct as are *R. Lindleianus* Lees, and *R. rhamnifolius* W. & N.

The author of the 'Flora of Plymouth' is curiously enough, though at the same time quite logically, given as the authority for "first record" of *Rubus hirtifolius* Müll. & Wirt., for Isle of Wight, through his having been allowed by Professor Babington to print some remarks forwarded in a letter embodying the statement, "I have what seems to be the same [as the Plymouth plant] from Alborne, Sussex, and Apse Castle Wood, Isle of Wight."—Fl. Plym., p. 117.

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* Two other new varieties of well-known species are named and characterised as follows:—*Lepidium Smithii*, var. b. *alatostyla*. "An interesting var., with the pouch not notched, the wings being adnate to the style throughout their length, has been found by Mr. J. Groves in tolerable plenty, between the rifle-range at Millbrook and Redbridge."—*Veronica arvensis*, var. b. *eximia*. "Plant prostrate, branches simple from the base of the stem, upper leaves, bracts and sepals not exceeding the capsule. A remarkable var., apparently constant under cultivation; possibly *V. arvensis*, var. *perpusilla* Bromf., from Isle of Wight (specimens are in Kew Herb.) belongs here.—Sandy field west of Hengistbury Head, 1879. The var. I have named *eximia* is a very distinct-looking plant; I have it under culture from seed, but it has not yet flowered. The growth of the central stem seems to be arrested at an early stage, and branches are produced from the axils of the cotyledons and lower leaves, giving the young plant the appearance of a compact tuft."

Every British botanist who wishes to increase his knowledge concerning critical plants and varieties, should not fail to obtain a copy of the 'Flora of Hampshire.'

T. R. A. B.

The recently issued part of Dr. Just's invaluable 'Botanischer Jahresbericht' concludes the records of the year 1878. The index of the species referred to in the two volumes for that year occupies nearly two hundred pages of three columns each.

Messrs. Vilmorin, Andrieux & Cie. have issued, under the title 'Plantes Potagères,' a handsome and fully illustrated volume devoted to the description and cultivation of the principal vegetables of temperate regions. Although not strictly a botanical book, it contains a large amount of information which will be very useful, and indeed invaluable, to those who study the history and development of cultivated plants.

So much interest attaches just now to Madagascar botany, that it is worth while to direct attention to the Rev. J. Sibree's very interesting volume entitled, 'The Great African Island' (Trübner & Co.). It contains much information regarding the more striking characteristics of Madagascar vegetation, the economic applications of trees and plants, &c. While speaking of Madagascar botany we may note that a list of plants of some considerable length is to be found in a little-known work entitled, 'A Voyage to Madagascar and the East Indies, by the Abbé Rochon . . . . Translated from the French. London, 1792.' The list is headed "Description of Trees, Shrubs and Plants, which grow in the northern part of Madagascar, and which I carried to the Isle of France in the end of the year 1768." The native names only are given, with notes on the uses of the plants, and it would probably in many cases be difficult to identify them.

The Fifth Annual Report of the Dulwich College Science Society (1882) contains a paper on the Botany of Dulwich, by Mr. S. W. Carruthers, the Secretary of the Society. It is entirely bibliographical, consisting of extracts dating from Merrett's 'Pinax' (1666) to Brewer's 'Flora of Surrey' (1863). Mr. Carruthers says that Dulwich "can still put in its claims to a flora"; and we hope he will give us in the next Report a list of the plants which still hold their ground there.

South African botanists have reason to be grateful to Messrs. MacOwan and Bolus, for the botanical portion of the 'Catalogue of Printed Books and Papers relating to South Africa," which has just been issued by the South African Philosophical Society, in the form of a pamphlet of 77 pages. Not only are separate works, dealing entirely or partially with South African plants, included, but a large number of papers in periodicals are indexed (under the authors' names), with, in many cases, brief but extremely useful notes by the compilers. We should be glad to see a similar work undertaken for British botany. The only point to which we could

take exception would be the citation of the new series of this Journal (1872–1882) as "Trim. Journ. Bot."; that abbreviation in strict accuracy applies only to the volumes for 1880–1882. 'Journ. Bot.,' followed by the date, will be found the most convenient, as it is the most accurate, mode of citation.

The 'Proceedings of the Linnean Society' from November 1880 to June 1882 has been issued during the past month. We are glad to learn that so useful a record, the temporary abandonment of which we always regretted, will be again issued regularly.

The recently issued (March) part of the 'Icones Plantarum' contains figures and descriptions of the following new genera:—*Eggersia* Hook. f. (Nyctagineæ); *Cardiochlamys* Oliv. (Convolvulaceæ); *Bembicia* Oliv. (Samydaceæ); *Thurnia* Hook. f. (Juncaceæ); *Silangea* Oliv. (Euphorbiaceæ); *Petræovitex* Oliv. (Verbenaceæ); *Riedelia* Oliv. (Scitamineæ); *Toxanthera* Hook. f. (Cucurbitaceæ); *Dittoceras* Hook. f., *Lygisma* Hook. f., and *Treutlera* Hook. f. (Asclepiadeæ). Of *Thurnia* two species are described, *T. sphærocephala* and *T. Jennani*; Martius's specimens of the former, on which the figure and description of Rudge (Pl. Guian. t. 12, as *Mnasium sphærocephalum*) are based, are in the British Museum Herbarium.

Articles in Journals.

American Naturalist. — J. F. James, 'Pitcher Plants.' — J. B. Ellis, 'New Species of North American Fungi.' — T. J. Burrill, 'New Species of *Micrococcus* (*Bacteria*).'

Annales des Sciences Nat. (6th Sér. xv. no. 3). — J. Vesque, 'Contributions à l'histologie de la feuille des Caryophyllinées' (concluded; 2 plates). — A. de Saporta, 'Résumé analytique of M. Nathorst's contributions to the fossil flora of Japan.' — B. Renault, 'Considérations sur les rapports des Lépidendrons, des Sigillaires, et des *Stigmaria*.'

Botanical Gazette. — Biographical sketch of A. Michaux.—I. T. Rothrock, '*Eriodictyon glutinosum* as illustrating evolution' (1 plate). —E. J. Hill, 'Notes on Indiana plants.'— C. C. Perkins, 'Ballast plants in Boston.'—A. Gray, '*Gonolobus Shortii*, n. sp.'

Botanisches Centralblatt (no. 9). — J. T. Sterzel, '*Dicksoniites Pluckeneti*' (concluded).—(No. 10). F. Hildebrand, 'Das Blühen und Fruchten von *Anthurium Scherzerianum*.'

Botanische Zeitung (Feb. 16, 23; March 2, 9). — A. F. W. Schimper, 'Ueber die Entwickelung der Chlorophyllkörner und Farbkörper' (1 plate).—(March 2). J. Wortmann, 'Erwiderung.' — (March 16). V. Fayod, 'Beitrag zur Kenntniss niederer Myxomyceten.'

Bull. Soc. Bot. France (xxix.; Comptes Rendus 3).—F. C. Hy, '*Fontinalis Ravanii*, sp. n.'—Mordt, 'Observations sur le tubercule des Ophrydées.' — Legué, 'Hybrides de *Primula*.' — E. Prillieux,

'*Rœsleria hypogæa*.' — A. Chatin, 'Les *Erica* de la Flore de Paris.' — Préaubert, 'Un nouvel appareil à dessécher.' — G. Rouy, '*Hieracium cymosum* L.' — P. Van Tieghem & G. Bonnier, 'La vie ralentie et la vie latente.' — P. Duchartre, 'Des Caieux pédiculés *Tulipa Gesneriana*.' — E. Bonnet, 'Quelques Jusquiames vénéneuses du groupe *Datora*.' — L. Mangin, 'L'Origine et l'insertion des racines adventives chez les monocotylédons.' — J. Cardot, '*Barbula sinuosa* Wils. — J. Vallot, 'Etudes sur les Flore du Sénégal' (with map).

Bulletin of Torrey Botanical Club (Feb.). — F. Wolle, 'Fresh-water Algæ' (many new species; 1 plate). — G. Vasey, 'New Grasses' (*Agrostis tenuis*, *A. humilis*, spp. nn.). — E. Tuckerman, 'New Western Lichens' (*Lecidea Brandegei*, *L. Pringlei*, *Acolium Sti. Jacobi*, spp. nn.); *Pyrenothammia* (gen. nov.) *Spraguei*).—C. C. Parry, '*Oxytheca luteola*, sp. n.'

Flora (Feb. 21). — C. Kraus, 'Untersuchungen über den Säftedruck der Pflanzen' (contd.). — (March 1). W. Nylander, 'Addenda nova ad Lichenographiam europæam' (many new species, including *Lecidea aggregatula* from Charnwood Forest, Leicestershire, *Verrucaria canella* from Bangor, *Lecanora miniatula* from Braemar, and *L. obliterascens* from Craig Tulloch). — (March 11). P. F. Reinsch, 'Ueber Algen ähnliche und eigenthümliche einzellige Körper in der Carbonkohle Central-Russlands' (2 plates). — L. Celakovsky, 'Ueber einige Arten resp. Rassen der Gattung *Thymus*.' — (March 21). C. Kraus, 'Untersuchungen über den Säftedruck der Pflanzen' (concluded).

Garden (March 3). — '*Cypripedium Spicerianum*' (ic. pict.).— (March 10). '*Abutilon vitifolium*' (ic. pict.).

Gardeners' Chronicle (March 3). — *Calanthe Regnieri* Rchb. f., *Phalænopsis Boxallii* Rchb. f., *Iris Bartoni* M. Foster, spp. nn. — (March 10). *Cœlogyne sparsa* Rchb. f., *Aeranthus Curnowianus* Rchb. f., *Angræcum cryptodon* Rchb. f., spp. nn.' — J. G. Baker, 'A Synopsis of the species of *Cyclamen*.* *Nuttallia cerasiformis* (fig. 44). — (March 17). *Oncidium ustulatum* Rchb. f., n. sp. —

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* Mr. Baker recognises seven distinct species of *Cyclamen*, *C. ibericum* being referred to *C. Coum* and *C. africanum* to *C. neapolitanum*. He arranges them thus:—

Flowering in Spring.

Large flowers, peduncle not twisting spirally in fruit ..	1. C. PERSICUM.
Smaller flowers, peduncle twisting spirally in fruit.	
Leaves orbicular or nearly so, without large deltoid teeth	2. C. COUM.
Leaves ovate-deltoid, thin, with large deltoid teeth.	3. C. REPANDUM.

Flowering in Autumn.

Corolla-lobes not auricled at the base.	
Calyx segments ovate..	4. C. EUROPÆUM.
Calyx segments lanceolate	5. C. CILICICUM.
Corolla-lobes with two large auricles at the base.	
Leaves with large deltoid teeth	6. C. NEAPOLITANUM.
Leaves without large deltoid teeth	7. C. GRÆCUM.

W. B. Hemsley, '*Salvia mexicana*, var. *minor*' (fig. 49). *Stauntonia latifolia* (fig. 50); *Eucharis Sanderii* (fig. 53).—(March 24). W. B. Hemsley, 'The Bermudas.' *Oncidium monachicum* Rchb. f. (fig. 54), *Rodriguezia caloplectron* Rchb. f., *Hedychium peregrinum* N. E. Brown, spp. nn. — *Colchicum crociflorum* (fig. 55). *Cotyledon Corderoyi* (fig. 56).

Journal of Linnean Society (Feb. 28). — M. T. Masters, 'Passifloreæ collected by E. André in Ecuador and New Granada' (*Tacsonia hederacea* Mast. & And., *Passiflora macrophylla* Mast.' *P. eminula* Mast., *P. Andreana* Mast., *P. anfracta* Mast. & Andr., *P. lorifera* Mast. & Andr., *P. resticulata* Mast. & Andr., spp. nn.; 2 plates). — H. N. Ridley, 'Teratological Notes' (monstrosity of *Carex glauca*; Pistillody in *Lolium perenne*; *Equisetum maximum* var. *serotinum*: see J. Bot. 1882, p. 246). — W. Nylander & J. M. Crombie, 'Lichens collected in Eastern Asia by A. C. Maingay' (many new species from British Burmah, Straits Settlements, China, and Japan).—W. E. Armit, 'Plants of North-West Queensland producing medicinal properties' (Abstract: *Grewia polygama* strongly recommended for dysentery). — J. G. O. Tepper, 'Tasmanian Plants near Adelaide.'—Id., 'Remarkable malformation of leaves of *Beyeria opaca* var. *linearis*' (1 plate). — J. M. Crombie, 'Lichens of "Challenger" Expedition' (*Lecidea Moseleyi*, sp. n.). —(March 24). J. G. Baker, 'Contributions to the Flora of Madagascar. Part i. *Polypetalæ*' (Many new species; plates of *Microsteira*, a new genus of *Malpighiaceæ*, and *Sparmannia discolor*. A short summary will be found in Journ. Bot. 1882, p. 382).

Magyar Növénytani Lapok. — F. Mentovich, 'Contributions to the knowledge of the Loranthus-barks, with special regard of the crystalliferous idioblasts found in them.' — J. Csató, '*Inula hybrida*.'

Midland Naturalist. — W. B. Grove, 'Nomad Fungi: Reclassification of *Uredineæ*' (contd.; 1 plate). — F. T. Mott, 'Hedgerows of Leicestershire.' — J. E. Bagnall, 'Flora of Warwickshire' (contd.).

Nature. — Grant Allen, 'The Shapes of Leaves.'—(March 15). W. B. Hemsley, 'Botany of "Challenger" Expedition.'

Œsterr. Bot. Zeitschrift. — H. Zukal, 'Bacterien-alsdirecte Abkömmlinge einer Alge' (1 plate). — L. Celakovsky, '*Hieracium corconticum*.' — K. Untchj, 'Flore von Fiume.' — J. Murr, 'Ins oberste Lechthal.'—P. G. Strobl, 'Flora des Etna' (contd.).

Science-Gossip. — E. Malan, '*Orchis mascula*.' — J. Spencer, '*Lyginodendron Oldhamianum*.'

Mr. Robert Lindsay, who acted as principal foreman under the late Mr. Sadler, has been appointed to the Curatorship of the Edinburgh Royal Botanic Garden.

W. Morgan del et lith

West Newman & Co imp

1. Carex sphærogyna *Baker*. 2. C. emirnensis *Baker*.

TWO NEW CARICES FROM CENTRAL MADAGASCAR.

By J. G. Baker, F.R.S.

(Tab. 238).

The two Carices here figured are selected from the large number of novelties which have been lately received from Madagascar, to illustrate how closely allied to British types are many of the species from the high levels of the centre of the island. They were both gathered recently by the Rev. R. Baron, F.L.S., in an excursion to the Ankaratra Mountains, the highest range in the Hova territory, which reaches an elevation of nearly 10,000 feet above sea-level.

Carex (Vulpia) **emirnensis**, n. sp. — Glabra, foliis pluribus linearibus elongatis, caule triquetro foliis 3–4 consimilibus reductis prædito, spicis 3–4 compositis remotis erectis pedunculatis, spiculis pluribus densis ovoideis sessilibus, inferioribus fœmineis, superioribus apice masculis, glumis ovato-lanceolatis acutis atro-castaneis, perigynio ampullæformi rostro bifido, fructu triquetro, stylis 3.

Stems about a foot long, erect from a short-creeping rhizome. Basal leaves several, linear, $\frac{1}{2}$–1 ft. long, $\frac{1}{6}$ in. broad, acuminate, firm in texture. Stem slender, triquetrous, bearing about 4 reduced leaves with long sheaths. Spikes ovate or oblong, $\frac{1}{3}$–$\frac{3}{4}$ in. long, remote, on stiffly erect peduncles, consisting of numerous crowded sessile ovate-oblong erecto-patent simple spikelets $\frac{1}{6}$–$\frac{1}{4}$ in. long, the lower entirely female, the upper male at the top. Glumes oblong-lanceolate, acute, $\frac{1}{6}$ in. long, glossy, dark chestnut-brown. Perigyne ampullæform, narrowed gradually into a bifid beak, not seen fully developed, ciliato-denticulate on the margin. Nut triquetrous. Styles and stamens each three. — Central Madagascar, *Baron* 2028! 2156! Of common European species allied to *C. divisa* and *disticha*. (Tab. 238, fig. 2.)

Carex sphærogyna, n. sp.—Glabra, foliis pluribus linearibus elongatis, caule triquetro foliis 2–3 consimilibus prædito, spicis circiter 4 contiguis breviter pedunculatis simplicibus, 3 inferioribus fœmineis cylindricis densifloris, glumis ovato-lanceolatis longe cuspidatis perigynio (cum rostro) æquilongis, perigynio globoso multicostato rostro brevi bifido, fructu triquetro, stylis 3, spica superiori unica cylindrica mascula, glumis lanceolatis membranaceis.

Stems densely cæspitose, above a foot long, with several linear basal leaves reaching a foot in length, glabrous, firm in texture, acutely triquetrous. Stem-leaves about three, the top one just beneath the spikes, which are usually four in number, contiguous, nearly sessile, the three lower female, the top one male. Female spikes cylindrical, $\frac{3}{4}$–1 in. long, $\frac{1}{4}$ in diam.; flowers erecto-patent, crowded in six regular rows; glumes 1-12th in. long, ovate-lanceolate, with a long cusp, greenish, firm in texture. Perigyne green, globose, $\frac{1}{2}$ lin. diam., strongly ribbed vertically, narrowed suddenly into a shorter bifid beak. Nut acutely triquetrous, subglobose,

polished, brown-stramineous. Male spike cylindrical, under ½ lin. long; glumes lanceolate, acuminate, membranous, pale brown, with a dark green keel. — Central Madagascar, *Baron* 2041 !* A near ally of *C. ampullacea*. (Tab. 238, fig. 1).

A CHINESE *CLETHRA*.

By H. F. Hance, Ph.D., F.L.S.

The genus *Clethra*, comprising about twenty-five species, is divided into two groups of very unequal extent. The first, with persistent foliage, and containing the great majority, is distributed from Mexico towards the southern extremity of the North American continent, through the different states of South America and the West India Islands, as far to the south as Brazil on the tropic, and Northern Chili; whilst there is besides a solitary outlying species in Madeira. Of the other, deciduous-leaved group, but four species have hitherto been known, two from the United States, another from Japan, and a fourth from the higher regions of some of the islands of the Malay Archipelago. To these I am now enabled to add a fifth, from the mountains of Kwang-tung, of which I subjoin a brief diagnosis.

Clethra Fabri, sp. n. — Ramulis hirtis, foliis oblongo-lanceolatis basi obtusiusculis apice acutis basin versus integris ceterum distanter obtuse glanduloso-denticulatis supra pilorum fasciculis consitis subtus præter costam nervosque hirtos glabris breviter petiolatis, racemi erecti rachi fulventi-hirta, bracteis lineari-lanceolatis caducis hirtis, pedunculis erectiusculis hirtis calycem parum superantibus, floribus cernuis, calycis tomentosi laciniis ovato-lanceolatis acutis, petalis oblongis obtusis medio intus parce pilosis calyce dimidio longioribus, filamentis glaberrimis, ovario dense hirsuto, stylo glaberrimo calyce duplo longiore.

In jugo Lo-fau-shan, prov. Cantonensis versus exitum m. Sept. 1882, reperit rev. Ern. Faber, cui lubens dicavi. (Herb. propr. n. 22125).

The specimen I possess is very scanty, and the leaves I have described are merely the upper ones at the base of the racemes. I think it is nearest *C. alnifolia* Linn.,—nearer than is *C. barbinervis* S. & Z.,—but in the shape of the calyx-segments and in the sparsely pilose petals it resembles *C. acuminata* Mx. The Malayan species I have no opportunity of comparing.

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* [Mr. Ridley identifies with this species specimens in the Herbarium of the British Museum, from Hildebrandt (3754), collected at Andrangoloáka, East Imerina. In these the female spikes are somewhat longer than those above described, one of them being 2¼ inches long.—Ed. Journ. Bot.]

CINCHONA LEDGERIANA.

By Henry Trimen, M.B., F.L.S.

With reference to the remarks upon *Cinchona Ledgeriana* by Dr. Kuntze, printed in the January number (pp. 5–9), it does not seem necessary to do more than controvert the two statements upon which his hybridity-theory is based.

Firstly. On p. 6 it is said "*C. Ledgeriana* originated spontaneously in the Government plantations of Mungpo in Sikkim"; and "Mr. Gammie and the late Mr. Biermann assured me that '*C. Ledgeriana* had originated spontaneously there in the Calisaya-field.'" To settle this it seemed best to write direct to Mr. Gammie on the subject, and this is what he replies (20 Feb., 1883):—"Dr. Kuntze must have one of our hybrids in his mind's eye, and not *Ledgeriana*, as having originated spontaneously in the Calisaya-field at Mungpo. Certainly I never told him so of *Ledgeriana*"; and he further adds, "You are quite right in thinking that *all* our Ledgerianas originated from the small packet of Ledger's S. American seed I got from the Nilgiris in the early part of 1866; and Moens is equally right in stating that I have never seen it from any other source. So that the Sikkim experience of it is identical with that of Java." This is conclusive, and I think it is pretty clear that if Dr. Kuntze ever knew *C. Ledgeriana* he does not know it now.

Secondly. Dr. Kuntze states (p. 7) "*C. Ledgeriana* is the only Cinchona that suffers from sterility, and only ripens more fruits if it gets fertilized and hybridized by other Cinchonas; that happens often, and therefore the descendants of *Ledgeriana* are mostly degenerated," &c. This being a practical matter I have requested the opinion of several Cinchona-growers upon it, and I now give some portions of a letter (30 Jan., 1883) from Mr. T. N. Christie, who is a very trustworthy observer, and possesses one of the finest plantations of *C. Ledgeriana* in Ceylon. He says, "I find *Ledgeriana* loth to blossom compared with *officinalis* or *Calisaya*, but in no way sterile. Climate and seasons affect the blossoming very greatly. The Yarrow Ledgers had a prolonged drought in 1881, many of them drooped and partially withered, and as a result were covered with seed the following season, so much so that many of the branches had to be propped up to bear the weight of the fruit. Last year they had a wet season and as a result they have not this year one third of their last crop. There is no sterility about the blossom when it comes; I find it comes perfectly true from seed." This is our experience throughout Ceylon; the species flowers later in life than the others, is quite as fertile as other kinds, and when protected from cross-fertilization and carefully collected the seed is remarkably true.

The contention of this species being a hybrid is thus a singularly unfortunate one; it is I think also much to be regretted that such unfounded and careless statements as those of Dr. Kuntze's should have been published. Further acquaintance with more and older

trees since the date of my former paper (Nov. 1881) has confirmed my opinion of the specific distinctness of *C. Ledgeriana* from *C. Calisaya*, and its "great variability" exists only in Dr. Kuntze's imagination.

In conclusion, I wish to insist again emphatically on the fact that there are no *C. Ledgeriana* trees in the East that have not descended from Mr. Ledger's seed from the Rio Mamore; the species is doubtless a very scarce one, and has not up to the present been re-discovered in S. America.

Peradeniya, Ceylon, March 8, 1883.

ON THE FLORA OF THE UPPER TAMAR AND NEIGHBOURING DISTRICTS.

By the Rev. W. Moyle Rogers, F.L.S.

(Concluded from p. 104).

Triglochin palustre L.—I. Northcot Mouth. Bude (Hind), beach, with *T. maritimum* L.

Orchis latifolia L.—I. Near Bude and Widmouth. II. and III. Bridgerule, in great quantity.

O. maculata L.—I. Between Wainhouse Corner and Tresparrot. III. Bridgerule. Apparently rare.

Habenaria bifolia Bab. Man.—III. Bridge Moor, in great quantity. "Church Meadow," Bridgerule. New record for N. Devon.

Listera ovata Brown.—III. Bridgerule Vicarage Plantation; in rather small quantity, but I suppose native.

Epipactis latifolia Auct.—II. Bridgerule, by canal. Whitstone, between Rectory and the school. III. Bridgerule, rather frequent.

E. palustris Crantz.—III. Bridgerule Bog. Very rare in S. W. England.

Iris fœtidissima L.—I. Knowle, hedge in one spot. Langford Hill Plantation, Marhamchurch. Rare.

Narcissus Pseudo-narcissus L. — I. About Knowle. Hedges between Burrow and Burrow Cross. III. Bridgerule. Denizen.

Galanthus nivalis L.—III. Bridgerule Vicarage Plantation. In great quantity, but no doubt introduced.

Tamus communis L.—I. II. III. Common.

Polygonatum multiflorum All.—I. Langford Hill Plantation, in great quantity and long established, if not actually wild. III. Bridgerule Vicarage Plantation. Planted not very many years ago.

Ornithogalum umbellatum L.—II. Near Newacott, between the house and the front gate; established in plenty.

Scilla verna Huds.—I. Cliffs near Sandymouth, abundant.

Allium ursinum L.—I. Near Bude. Stratton. Marhamchurch. III. By the river at North Tamerton. Not very common.

Narthecium ossifragum Huds.—I. Between Wainhouse Corner and Tresparrot. III. Bridgerule Bog. Near Dunsland Cross. IV. Near Okehampton. Locally abundant.

Luzula pilosa Willd.—I. Tackbear Lane.

L. sylvatica Bich.—I. Between Stratton and Launcells. St. Knighton's Kieve. IV. Near Okehampton. Local.

L. multiflora Koch.—II. and III. Bridgerule, common.

Juncus glaucus Sibth.—I. Bude. II. and III. Bridgerule.

J. supinus Mœnch.—III. Bridgerule. Dux Common.

Scirpus palustris L.—I. II. III. Common.

S. multicaulis Sm.—III. Bridgerule Bog. Near Dunsland Cross. New record for North Devon.

S. pauciflorus Lightf.—I. Damp hollows on Summerleaze Down, in plenty. New record for East Cornwall. Reckoned a West Cornwall plant only on the authority (queried in 'Topographical Botany') of Jones's Botanical Tour. Apparently very rare in S. W. England generally.

S. fluitans L.—III. Bridge Moor. Near Dunsland Cross. New record for North Devon.

S. Savii S. & M.—I. Lane near Tackbear. Boscastle. Tintagel.

S setaceus L.—Common in all the districts.

Eriophorum angustifolium Roth.—I. Northcot Mouth. Between Wainhouse Corner and Tresparrot. III. Bridgerule Bog. IV. Near Okehampton.

Carex pulicaris L.—II. and III. Bridgerule, frequent.

C. paniculata L.—III. Bridgerule Bog.

C. vulpina L.—I. Sandymouth. Poughill. Bude. II. By canal at Bridgerule; the only station away from the seacoast where I have as yet seen it in this whole neighbourhood.

C. stellulata Good.—III. Bridgerule. IV. Okehampton.

C. remota L.—I. II. and III. Very common.

C. ovalis Good.—I. St. Knighton's Kieve. III. Bridgerule and Tinney, common.

C. vulgaris Fries.—I. Near Bude. II. & III. Commoner than I remember to have seen it anywhere else. IV. Near Okehampton.

C. glauca Scop.—Sadly too common everywhere.

C. pilulifera L.—I. Tackbear Lane. II. Near Littlebridge. Bridgerule. III. Dux Common. IV. About Okehampton.

C. præcox Jacq.—I. Summerleaze Down, very abnndant. IV. Hill near Okehampton.

C. panicea L.—II. Near Littlebridge, Bridgerule. III. Bridgerule, common. IV. Okehampton.

C. sylvatica Huds.—I. II. III. Common.

C. lævigata Sm.—IV. Near Okehampton.

C. binerris Sm.—III. Near Dunsland Cross. IV. Okehampton.

C. distans L.—I. In damp hollows on Summerleaze Down, and in the salt marsh (to the edge of the beach) at Bude.

C. fulva Good.—I. Tackbear. II. Between canal and river south of Bridgerule. III. Bridge Moor and Bridgerule Bog, in great quantity. Not in 'Topographical Botany' for North Devon, but sent me in 1881 from the neighbourhood of Westward Ho, by Mr. H. A. Evans. A very different looking plant from *C. distans*, not only as the latter occurs on the coast, but also as I have seen it in inland stations on Exmoor and on Salisbury Plain.

C. flava L., b. *lepidocarpa*.—I. Wainhouse Corner. Boscastle. II. Near Burrow Cross. III. Bridgerule, common. Varies a good deal according to soil and degree of moisture.

C. hirta L.—I. Sandymouth. Northcot Mouth. Bude. III. Bridgerule. Uncommon.

C. vesicaria L.—II. and III. On both sides of the river from Bridgerule to North Tamerton in great quantity. New record for North Devon.

Alopecurus pratensis L.—III. Bridgerule. Near Holsworthy. IV. Okehampton.

Phleum arenarium L.—I. Widmouth.

Agrostis canina L.—I. Tackbear. II. & III. Bridgerule, frequent.

Phragmites communis Trin.—I. Widmouth.

Milium effusum L.—I. St. Knighton's Kieve, in great quantity.

Aira cæspitosa, L.—Very common.

A. caryophyllea L.—Common.

A. præcox L.—I. Boscastle. IV. Okehampton.

Avena flavescens L.—I. Bude. III. Bridgerule. IV. Okehampton.

A. pubescens L.—I. Roadside banks between cliffs and canal, about a mile to the south of Bude. In no great quantity, but apparently native. New record for East Cornwall.

A. strigosa Schreb.—III. Bridgerule. Near Holsworthy. One plant only in each case. Casual.

A. fatua L.—I. Marhamchurch. II. Bridgerule.

Holcus mollis L.—Almost as common as *H. lanatus* L.

Triodia decumbens Beauv.—I. Sandymouth. Bude. Widmouth. III. Bridgerule, common.

Molinia cærulea Mœnch.—Very frequent and most abundant locally in all the districts.

Glyceria fluitans Brown., b. *pedicillata*.—III. Bridgerule, rather frequent, but not nearly so general as the type.

G. plicata Fries.—I. Knowle. Tackbear. II. and III. Bridgerule. IV. Okehampton. Appears fairly frequent.

Sclerochloa rigida Link. — I. Kilkhampton village. Bude. Widmouth.

S. loliacea Woods.—I. Widmouth. Boscastle.

Poa compressa L.—IV. Okehampton.

Briza media L.—I. Bude. Tackbear. II. and III. Bridgerule.

Festuca sciuroides Roth.—I. Near Bude. III. Pyworthy. Apparently very local.

F. ovina L., c. *glauca*.—I. Bude beach. The type is very general.

F. rubra L., a. *duriuscula*.—I. II. III. Common.

F. elatior L.—I. Common. III. Bridgerule.

F. pratensis Huds.—I. Northcot Mouth.

Bromus giganteus L.—I. II. III. Common.

B. asper Murr.—I. Hedges east and west of Stratton. Between Burrow and Marhamchurch. Tackbear. II. Between Bridgerule village and the canal. Whitstone. Quite rare on the western side of the river, and not seen at all as yet between the river and Okehampton.

B. sterilis L.—I. II. III. Rather frequent.

B. racemosus "L."—II. and III. Bridgerule.

Triticum junceum L.—I believe that most of the *Triticum* along the seashore, from Northcot Mouth to Widmouth, belongs to this segregate.

Lolium italicum L.—I. II. III. A common colonist.

Lepturus filiformis Trin.—I. On beach, and near the breakwater at Bude; a large form.

Hordeum murinum L.—I. Bude.

Lomaria Spicant Desv.—II. III. IV. Very common.

Asplenium Ruta-muraria L.—Common.

A. Trichomanes L.—II. Werrington.* IV. Sticklepath. Apparently quite rare.

A. lanceolatum Huds.—I. Tintagel, remarkably abundant.

A. Adiantum-nigrum L.—I. Near Bude. Boscastle and Tintagel. II. Near Werrington. III. Bridgerule. IV. Okehampton. Sticklepath. Absent from large portions of I. II. III.

Aspidium aculeatum Sw.—III. Bridgerule. Apparently rare.

A. angulare Willd.—I. II. III. Rather common.

Nephrodium Filix-mas Rich., c. *Borreri*. — I. II. III. Very general, perhaps quite as common as the type.

N. æmulum Baker.—I. Near Stratton. Burrow. Knowle. Tackbear. Week St. Mary. II. Whitstone. III. Bridgerule and Pyworthy, frequent. Much commoner by the Upper Tamar than in the Teign Valley.

N. Oreopteris Desv.—III. Bridgerule:—Tatson Lane and Launceston Road, near Tinney. Between Pyworthy Village and Launceston Road.

Osmunda regalis L.—III. Pancrasweek. Bridgerule, in considerable quantity.

Equisetum palustre L.—I. Bude. Widmouth. II. and III. Bridgerule.

E. limosum L.—II. and III. Bridgerule.

A NEW AFGHAN PLANT.

By W. B. Hemsley, A.L.S.

The plant described below was overlooked at the time Dr. Aitchison's collections were published in the Linnean Society's Journal (xviii., xix).

Tanacetum Johnstonii, n. sp.—*T.* gracile glabrescens, capitulis parvis homogamis corymbosis, corymbis oligocephalis in racemos nudos elongatos dispositis.

Herba caulibus erectis, gracilibus, subsimplicibus, primum lanoso-puberulis, deinde glabris. *Folia* (caulina tantum visa) pilosula, 2–3-pinnatisecta, 2–4 poll. longa, ad 1 poll. lata, segmentis

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* I reckon this, as well as Bridgerule West, in my District II., as being on the western side of the river, though politically in Devon.

linearibus, acutis. *Capitula* homogama, 1½–2 lineas diametro, multiflora, corymbosa, floribus omnibus hermaphroditis, quinquedentatis; corymbi 3–5 cephali, breviter pedunculati, in racemos undos elongatos terminales dispositi; involucri bracteæ glabræ, pluriseriatæ, ovato-oblongæ, obtusissimæ margine scariosæ, interiores omnino scariosæ; receptaculum hemisphæricum. *Achenia* nondum matura glandulosa, basi callosa; pappus brevis, coroniformis, denticulatus.

Afghanistania, in convalle Logar, Wilson Johnston M.D. legit.

This very distinct species of *Tanacetum* was collected with a few other plants in the Logar valley, Afghanistan, by Dr. Wilson Johnston, and communicated to Dr. J. E. T. Aitchison, by whom it was presented to the Kew Herbarium. In its strict habit it resembles *Erigeron canadense*; and in its flower-heads it is not unlike *Tanacetum fruticulosum*, but it is apparently quite herbaceous.

ON *SPHÆRELLA* AND ITS ALLIES.

By M. C. Cooke, M.A., LL.D.

(Concluded from p. 110).

172*Sphærella Astragali Currey, Linn. Trans., xxii., No. 362.—Peritheciis sparsis, membranaceis, tectis, globosis, atrofuscis, minutis, hinc illic gregariis. Ascis clavatis. Sporidiis subfusiformibus, uniseptatis, hyalinis (·015–·018 × ·004 mm.).

On stems of *Astragalus*. Arctic America.

This has nothing in common with *Diaporthe*, to which it is referred by Saccardo (p. 437), although there is no reference to it in the 'Repertorium' at p. 696; hence it must be assumed to be excluded.

173*Sphærella lathyrina B. & C.; *Didymella lathyrina* Sacc., Syll., No. 2167.—Sporidia ·008 × ·0025 mm.

On *Lathyrus* stems. U.S.

This certainly is a *Sphærella* with a minute membranaceous perithecium, and in all respects allied to the species included by Saccardo himself in that genus.

212*Sphærella minimæpuncta Cke., Rav. Amer. Fungi, No. 681.—Sparsa vel aggregata. Peritheciis punctiformibus, emergentibus, atris. Ascis clavatis, breviter stipitatis. Sporidiis ellipticis, continuis, hyalinis (·008 × ·003 mm.).

On stems of *Gladiolus*. S. Carolina.

218*Sphærella californica Cke. & Hark.—Peritheciis exiguis, sparsis, subsphæroideis, innato-prominulis, nigro-fuscis, poro pertusis. Ascis clavato-cylindricis. Sporidiis arcte ellipticis, uniseptatis, nec constrictis, hyalinis (·008 × ·002 mm.).

On native grass. California (Harkness, No. 1242).

We had regarded this as the perfect condition of *Sphæria perpusilla*, of which *Lastadia perpusilla* Sacc. was the immature form; but, since the spermological system gives excellent facilities

for describing the same species twice over, we cannot do other than give its diagnosis, although still of the same opinion that the one is a condition of the other. Under any circumstances this is the most perfect form.

220*Sphærella eumorpha B. & C.; *Didymella eumorpha* Sacc. Syll., No. 2191.—Sporidia uniseptate, ·012 × ·003 mm., sometimes reaching as much as ·015 × ·003 mm.

On *Arundinaria*.

If the form of the sporidia is to be the crucial test of a species, then this must belong to *Sphærella*.

221***Sphærella philochorta** Cke.—Epiphylla, sparsa. Perithecciis minutis, globosis, prominulis, atris, epidermide ostiole papillato pertusa velatis. Ascis clavatis. Sporidiis arcte cylindrico-ellipticis, utrinque obtusis, uniseptatis, vix constrictis, hyalinis (·014—·017 × ·003 mm.).

On leaves of grasses. Maine U.S.A.

Sphærella epistroma Cke.—Culmicola, aggregata, innato-prominula, minutissima, nigra, strias brevas (1 lin.) densas exhibens. Ascis cylindricis. Sporidiis fusiformibus, rectis curvulis-ve, uniseptatis, nec constrictis, hyalinis (·016—·018 × ·0035 mm.).

On culms of straw. Britain.

Forming little scattered lines, like a hyphen (-) about a foot long.

233*Sphærella depressa Cke.; *Physalospora depressa* Sacc. Syll., 1709.

On *Luzula*. Campbell Island.

Sporidia lanceolate, uniseptate, hyaline.

This is in every respect a *Sphærella*, according to the original type specimens.

237*Sphærella carectorum B. & C. North American Fungi No. 965.

Minuta, punctiformis, sparsa, prominula. Ascis clavatis. Sporidiis breviter fusiformibus, quadrinucleatus, demum uniseptatis, nec constrictis, hyalinis.

On leaves of *Carex folliculata*. United States.

238*Sphærella caricicola Fckl. (*Læstadia caricicola* Sacc. Syll., No. 51).—Sporidia uniseptate ·01—·012 × ·003 mm.

From original specimens published by Fuckel, No. 1772, according to our copy. Some would think that there must be two species on the same specimens, but we are disposed rather to consider this the more matured condition of the fruit than in the specimens from which Fuckel drew up his original diagnosis.

Sphærella intercellularis B. & C. (*Didymella intercellularis* Sacc. Syll., 2183).—Sporidia elliptical, uniseptate, ·012 × ·0035 mm.

On leaves of *Typha*.

Perithecia collected together on small darker spots, with all the characters of a genuine *Sphærella*.

260. Sphærella nyssæcola Cke.—Subsequent examination of more mature specimens has demonstrated this to be a good *Sphærella* with uniseptate sporidia (·008 × ·0025 mm.), and that it forms a part at least, if not the whole, of *Asterina erysiphoides* B. & C., according to specimens in Herb. Berk.

271. Sphærella Armoraciæ (Fckl.).—We fail to distinguish any difference, in external appearance, asci, or sporidia, or its stylosporous condition, between this species and *Sphærella Brassicæcola* (Duby), No. 121.

Sphærella Panacis Cke. — Hypophylla, gregaria, maculæformis. Peritheciis minimis, subglobosis, atris, semi-innatis, maculis orbicularibus vel irregularibus formantibus. Ascis cylindrico-clavatis, sessilibus. Sporidiis arcte ellipticis, hyalinis, uniseptatis (·01 × ·0025 mm.).

On leaves of *Panax crassifolia*. New Zealand, South Island (Kirk, No. 89).

Sphærella majuscula Cke. — Epiphylla, gregaria sparsave, sæpe maculæformis. Peritheciis majusculis, globosis, atris, semi-innatis, prominulis; ostiolo punctiformi. Ascis cylindrico-clavatis. Sporidiis arcte ellipticis, uniseptatis, loculo inferiore leviter tenuiore, hyalinis (·012 × ·003 mm.).

On dead leaves of *Senecio rotundifolius*. Stewart Island, New Zealand (Kirk, No. 132).

A most distinct and conspicuous species.

Sphærella Ilicis Ellis, in Amer. Nat. xvii. 1883, p. 317.—Amphigena. Maculis rotundatis, superne albis, inferne brunneis, margine elevato purpureo circumdatis. Peritheciis punctiformibus, subglobosis, semi-innatis, prominulis; ostiolo amplo. Ascis oblongo-cylindricis ·04–·055 × ·0075–·011 mm. Sporidiis biserialibus, clavato-oblongis, sublhyalinis, uniseptatis, leviter constrictis (·013–·015 × ·003 mm.).

On living leaves of *Ilex glabra*. New Jersey (U. S. A.).

Sphærella Muhlenbergiæ Ellis, in Amer. Nat. xvii., 1883, p. 317.—Peritheciis erumpentibus, minutis, plerumque elongato-serialibus. Ascis oblongis (·035 × ·0095 mm.). Sporidiis ellipticis, uniseptatis (·011–·015 × ·003–·0035 mm.). Stylosporis in peritheciis majoribus, oblongo-fusiformibus (·013–·019 × ·004 mm.) binucleatis.

On leaves of *Muhlenbergia*. Newfield, New Jersey (U. S. A.).

"Possibly not sufficiently distinct from *S. graminicola* Fckl."

The following species of *Sphærella* (*Læstadia*) belong to the first section of this communication :—

Sphærella (Læstadia) **asarifolia** Cke.—Epiphylla. Maculis orbicularibus, confluentibusque, fuligineis. Peritheciis exiguis, globosis, atris, poro pertusis, confertis, circinato-dispositis. Ascis subcylindricis (·03 mm. long). Sporidiis ellipticis, continuis, hyalinis (·007 × ·0025 mm.).

On leaves of *Asarum arifolium*. Seaboard of Carolina. U. S. (Rav., No. 3277).

Sphærella (Læstadia) **Paronychiæ** Cke. — Amphigena, sparsa, punctiformis. Peritheciis minimis, atris, globosis, semi-immersis. Ascis cylindraceis (·014 × ·008 mm.). Sporidiis arcte ellipticis, continuis, hyalinis (·008 × ·0025 mm.).

On fading leaves of *Paronychia serpyllifolia*. Luchon, France (No. 1827).

Old specimens without name from the herbarium of Count Limminghe have on them the above, mixed with *Hendersonia microphylla* Cke., and *Pleospora Paronychiæ* Cke. All similar in appearance and habit, except that the perithecia of the *Pleospora* are nearly double the size of the others.

Sphærella (*Læstadia*) juniperina Ellis, in Amer. Nat., xvii., 1883, p. 917.—Perithecia primo tecta, dein nuda, sparsa, plerumque confluens. Ascis fasciculatis (·035–·04 × ·007–·008 mm.). Sporidiis inordinato-biserialibus, clavato-oblongis, granulosis, hyalinis (? septatis) (·009–·011 × ·0035 mm.).

On fading leaves of *Juniperus communis*. Iowa (U. S. A.).

Species dubiæ et excludendæ.

Sphæria tigrinans Schwz., No. 1804, is a *Sphærella* in appearance, but the small original specimen is sterile.

Sphæria nigrificans Schwz. — The original specimen is a scutellate discomycete with globose sporidia.

Sphæria collapsa Schwz., No. 1784, is also a Discomycete, and probably an imperfect *Pocillum*, in a young state, with the paraphyses developed, or it may be filiform stylospores, but no asci.

Sphæria Fragariæ Schwz., No. 1769.—Whether *Gnomonia* or *Sphærella*, is without fruit, and certainly there are no very prominent ostiola.

Sphæria Mori-albæ Schwz., No. 1687.—Perithecia much too carbonaceous for a *Sphærella*, but without fruit.

Sphærella epitaphra B. & C. in Herb.—The only specimens we have seen are a species of *Discosia*. Although distributed no description appears to have been published.

? Sphærella heloniæfolia Cke. & Ellis, Grevillea, viii., 16.—Is a *Hendersonia*, according to more perfect specimens.

Sphæria excipulans Schwz., No. 1803.—Has no affinity with *Sphærella*; the perithecia are too carbonaceous, and no fruit can be found.

Sphærella apertiuscula Schwz., No. 1785.—May probably belong to *Sphærella*, but the authentic specimen is without fruit.

Sphærella plantaginicola Schwz., No. 1806.—Although the authentic specimens have small asci, the sporidia are imperfect, so that its position cannot be determined.

Sphæria Kalmiæcola Rav. Fungi. Amer., No. 682, on leaves of *Kalmia latifolia*, was carelessly issued under this name in error. It is not an *Ascomycete* but perhaps a *Coccularia*. The same thing on *Andromeda* has been distributed as *Sphæria Andromedæ* Schwz. The only *Sphæria Kalmiæcola* of Schw. is the species called by him *Depazea Kalmiæcola*, and that is either the *Phyllosticta Kalmiæcola* or *Sphærella colorata*, according as it is stylosporous or ascosporous. This is, however, the same as authentic specimen of *S. Kalmiarum*, No. 1701. The *Sphæria Andromedæ* is the same as *Sphæria Andromedarum* Schwz., No. 1702.

Sphæria arbuticola Fr. Desm., No. 976, has the appearance of a *Sphærella* perhaps, but as far as our specimens go is only a *Phoma*.

VARIATION IN NEW ZEALAND FERNS.

By H. C. Field.

I have thought that the following notes respecting our New Zealand Ferns may interest some of those who give attention to that class of plants, and particularly to those who seem disposed to regard slight differences as sufficient to constitute new varieties. The differences in the same ferns are surprising, and in some localities they seem to occur in different ways from those observed in others. In England they seem to run in the directions of cresting or depauperisation, while here they are rather in colour, and particularly in variegation and in texture. During more than thirty years' residence, spent mostly in the bush, I have never met with a crested New Zealand Fern, and only once or twice with depauperated ones; while variegations of yellow, crimson, and copper-colour are very common; and hardly any two plants are exactly alike in texture and character of foliage. But one of the most striking differences is the tendency which many of them have to occur in creeping and non-creeping forms. *Nephrodium decompositum*, for instance, creeps rapidly, and soon covers a large space of ground; while its var. *glabellum* will never spread six inches, and is usually a tufted plant. *N. hispidum* again occurs in the two forms, and occasional plants of *N. velutinum* creep to some extent. *N. Thelypteris* seems always to creep, but some plants do so far more than others. Most of our Lomarias exhibit the same peculiarity, and some plants of one (*L. vulcanica*) send up single fronds at intervals from a creeping rhizome, while others produce caudices with tufted crowns in the same way. Some plants of *Davallia* again creep rapidly from the time that the first fronds appear, while others will take many years to travel beyond the margin of a six-inch pot; and in one part of the colony (Tuhua) this fern occurs as a distinctly-tufted plant, and in large specimens develops a stout conical caudex like that of the Todeas. These peculiarities are of consequence in selecting plants for cultivation, and great difference of opinion exists among our New Zealand fernists as to how far they should be regarded as constituting new varieties, particularly as there is sufficient difference in the foliage to enable the kinds to be at once distinguished. The foliage of the creeping *Davallia* is wiry, and the frond rarely more than a foot high and of ovate-lanceolate form; while the non-creeping one is often three feet high, with triangular fronds and thin texture. The tufted one, however, has a wiry frond, scarcely distinguishable from that of the creeping plant. The variation of the foliage is in fact far less than occurs in different plants of what no one disputes as the same fern—as for instance, *Asplenium bulbiferum*, which ranges from merely pinnate, with entire or barely indented edges, to tripinnate, with deep narrow lobes like those of *A. Colensoi*, and from a harsh texture almost like that of *A. flaccidum*, so that it is often difficult to class the plant, to thin and plumose forms. *A. flaccidum* again varies greatly, some plants appearing like merely

enlarged specimens of the English mountain spleenwort, while others have broad oval or triangular pinnæ. Some forms of it also creep considerably, and produce fresh tufts along the rhizomes, whilst the great majority never do so. Some forms of *A. obtusatum* again propagate themselves in the same way, and there is a great difference in plants of *A. umbrosum* in the same respect, as well as in the character and colour of the foliage. As a rule, non-creeping forms have broader thinner foliage than creeping ones. In fact, if the various peculiarities of our New Zealand Ferns sufficed to constitute separate varieties, we should require thousands of names to designate the whole of them, and should have to be constantly adding to the list as fresh forms appeared or were noticed. A slight difficulty in classing occasional plants is, to my mind, a far less evil than this would be; and the more so as, even now, many persons are deterred from studying our ferns by the difficulty which they experience in recollecting the names of the several kinds. It is a great pity that so many of our ferns are being destroyed, through the country being cleared and brought into cultivation. Some kinds, formerly tolerably plentiful here, are no longer to be found at all, the places where they grew being now under grass or crop, and no doubt this evil will increase as time goes on; and therefore anything which deters people from cultivating, and so saving, the plants is to be deprecated.

A SYNOPSIS OF THE GENUS *SELAGINELLA*.

By J. G. Baker, F.R.S., &c.

(Continued from p. 100).

45. **S. revoluta,** n. sp.—Stems densely matted, trailing, 1–2 in. long, pale, angled on the face, copiously pinnately branched, with short slightly compound branches. Leaves of the lower plane spreading, moderately close, oblong-lanceolate, acute, ½ lin. long, moderately firm in texture, revolute, the midrib nearly central, the upper margin a little more convex than the lower, the edges ciliated; those of the upper plane a third as long, ovate, acute, much imbricated, strongly ciliated. Spikes very short, square, ½ lin. diam.; bracts ovate, acute, much imbricated, strongly keeled.

Hab. Near Maypures and below San Fernando, on the banks of the Orinoco, *Spruce* 3621! Near *S. aggesta* of the Himalayas.

46. S. PATULA Spring Mon. ii. 97?; *S. sarmentosa* A. Br.—*Lycopodium patulum* Swartz?; *L. nitidum* Hook. & Grev.—Stems slender, pale, trailing, reaching 6–9 in. long, angled on the faces, with a long whiplike tip and numerous short alternate pinnately arranged branches, with 3–7 branchlets. Leaves of the lower plane crowded, erecto-patent, oblong-lanceolate, subacute or subobtuse, bright green, moderately firm in texture, the midrib distinct, rounded, ciliated and imbricated over the rachis on the upper side at the base; leaves of the upper plane a third as long, oblique ovate,

acute. Spikes $\frac{1}{4}$–$\frac{1}{2}$ in. long, $\frac{1}{2}$ lin. diam., square; bracts ovate-cuspidate, much imbricated, strongly keeled.

Hab. Jamaica, *Bancroft*! *Wilson*! Common in cultivation. Marked at a glance from *S. serpens* by its caudate stem and fewer more compound branches.

47. S. Schiedeana A. Br. in Ann. Sc. Nat., ser. 4, vol. xiii., 62; *S. fimbriata* Liebm., non Spring; *S. Liebmanni* Fourn.; *S. serpens* Spring, ex parte.—Stems trailing, pale, square, flat on the face, reaching a length of half a foot, forked, copiously pinnately branched, the branches short, often with several branchlets. Leaves of the lower plane close or rather spaced, oblique oblong, rather ascending, bright green, flat, moderately firm in texture, subobtuse, ciliated, but little rounded and not imbricated over the stem on the upper side at the base; leaves of the upper plane a third as long, oblique ovate, cuspidate, imbricated. Spikes short, square; bracts ovate-lanceolate, much imbricated, strongly keeled.

Hab. In Mexico at Passantla, *Schiede* and *Deppe*, *Liebmann*! A near ally of *S. sertata*.

48. S. sertata Spring Monog. ii., 104.—Stems slender, pale, trailing, square, flat on the face, forked and copiously pinnately branched, with copiously compound branches. Leaves of the lower plane rather ascending, crowded or rather spaced on the branches, pale green, moderately firm in texture, oblique lanceolate, $\frac{3}{4}$–1 lin. long, flat, subacute, with a distinct midrib, the upper side but little rounded at the base and scarcely at all imbricated over the stem; those of the upper plane a third as long, oblique oblong, cuspidate. Spikes square, $\frac{1}{4}$–$\frac{1}{2}$ in. long, $\frac{1}{2}$ lin. diam.; bracts ovate-lanceolate, acute, strongly keeled.

Hab. Nicoya and Panama, *Dr. Sinclair*! Although the stems are continuous, this has some of the root-fibres anticous. In general habit it closely resembles *S. plumosa*.

49. S. saccharata A. Br., in Fil. Nov. Gran. 356; *S. sanguinolenta* Liebm., non Spring; *S. Spirillum* Liebm.—Stems trailing, subterete, $\frac{1}{2}$–1 ft. long, forked and copiously pinnately branched, the branches copiously compound. Leaves of the lower plane ovate or oblong, those of the branches crowded or rather spaced, $\frac{1}{2}$ lin. long, obtuse, flat, moderately firm in texture, pale green, turning bright red when old, the distinct midrib nearly central, both sides decidedly cordate and strongly ciliated at the base, the upper imbricated over the stem; leaves of the upper plane half as long, oblique oblong, incurved, acute, much imbricated. Spikes $\frac{1}{4}$–$\frac{1}{2}$ in. long, $\frac{1}{2}$ lin. diam., square; bracts crowded, ovate-lanceolate, strongly keeled.

Hab. Mexico, *Schaffner*! *Liebmann*! *F. Muller* 737! Curls up in drought, like *S. delicatissima*.

50. S. Douglasii Spring Monog. ii., 92; *L. Douglasii* Hook. and Grev.; *L. ovalifolium* Hook. & Grev. Ic. t. 177.—Stems trailing, 3–6 in. long, pale, subterete, forked low down, pinnately branched, with copiously compound lower branches. Leaves of the lower plane crowded or slightly spaced, rather ascending, pale green, firm in texture, broad oblong, obtuse, nearly flat, midrib

obscure, both sides auricled and ciliated at the base, the upper much imbricated over the stem; leaves of the upper plane half as long, oblique oblong, cuspidate. Spikes $\frac{1}{2}$–1 in. long, $\frac{1}{2}$–1 lin. diam.; bracts deltoid, cuspidate, much imbricated, strongly angled on the back.

Hab. British Columbia, Oregon, and Washington territory. A well-marked species.

51. S. ovalis, n. sp.—Stems slender, trailing, above a foot long, terete on the back, angled on the face, copiously distantly pinnately branched, the branches short, ascending, flabellately compound. Leaves of the lower plane ovate, acute, ascending, $\frac{1}{2}$–$\frac{3}{4}$ lin. long, crowded on the branches, bright green, firm in texture, rather more produced on the upper side of the distinct midrib, shortly ciliated through the lower half of the upper margin, rounded on both sides at the base, not cordate on the upper, but so much imbricated over the branch that it is hidden; leaves of the upper plane a third as long, ovate, acute, convergent, much imbricated. Spikes unknown.

Hab. Rapids of the Rio Mauhes, Amazonas, North Brazil, *Dr. Traill* 1416!

Group 2.—Plumosæ.

52. S. uncinata Spring Mon. ii. 109; *Lycopodium uncinatum* Desv.; *L. dilatatum* Hook. & Grev.; *L. cæsium* Hort.; Dill. Musc. tab. 65, fig. 7. — Stems weak, slender, pale straw-coloured, bisulcate on the face, trailing to a length of 1–2 feet, with a long excurrent tip, and alternate short pinnately arranged copiously compound branches. Leaves of the lower plane oblique oblong, subovate, 1-12th to 1-8th in. long, close or rather spaced on the branches, thin in texture, bright blue-green, rather more produced on the upper side of the distinct midrib, not ciliated, minutely petioled, both sides cordate at the base, the upper scarcely imbricated over the stem; leaves of the upper plane $\frac{1}{3}$ as long, oblique oblong, cuspidate, much imbricated. Spikes $\frac{1}{4}$–$\frac{1}{2}$ in. long, square, 1 lin. diam.; bracts ovate-lanceolate, a line long, crowded, sharply keeled.

Hab. China. Well known in cultivation.

53. S. semicordata Spring Mon. ii. 107; *Lycopodium semicordatum* Wall. ex parte. — Stems trailing, slender, pale straw-coloured, often a foot long, bisulcate on the face, copiously pinnately branched, with short densely compound branches. Leaves of the lower plane contiguous, spreading or rather ascending, oblong-lanceolate, 1-12th to 1-8th in. long, subobtuse or subacute, paler green and not so firm in texture as in *plumosa*, nearly equilateral, the midrib distinct, the upper side not all dilated at the base, not imbricated over the stem, and not ciliated; leaves of upper plane $\frac{1}{3}$ as long, oblique oblong, cuspidate, much imbricated. Spikes $\frac{1}{4}$–$\frac{1}{2}$ in. long, $\frac{3}{4}$–1 lin. diam. square; bracts ovate, acute, strongly keeled.

Hab. Frequent in the East Himalayas, and gathered by Alexander at Chusan. *S. semicordata* of J. Scott's 'List of the Higher Cryptogams of the Calcutta Garden,' p. 63, is founded on

a plant of Dr. Hamilton's, included by Wallich under his *L. semicordatum*, which I believe to be a form of *S. monospora* with slightly dimorphic bracts.

54. S. AURICULATA Spring. Mon. ii. 108; *S. plumosa* Presl.—Stems trailing, about half a foot long, bisulcate on the face, copiously pinnately branched, the branches but little compound. Leaves of the lower plane close, oblong-lanceolate, 1-12th to 1-8th in. long, about three times as long as broad, spreading or rather ascending, bright green, moderately firm in texture, nearly equilateral, the midrib distinct, the upper side obscurely ciliated, a little dilated at the base, and slightly imbricated over the stem; leaves of the upper plane a third as long, broad ovate, distinctly cuspidate. Spikes $\frac{1}{2}$–1 in. long, square, $\frac{1}{2}$ lin. diam.; bracts ovate, acute, crowded, sharply keeled.

Hab. Philippines, *Cuming* 2013! A near ally of *S. plumosa*.

55. S. AUSTRALIENSIS Baker; *S. concinna* Benth. Fl. Austral. vii. 678, non Spring.—Stems trailing, $\frac{1}{2}$–1 ft. long, forked at base, bisulcate on both back and face, pinnately branched, with copious compound branches. Leaves of the lower plane oblong-lanceolate, acute, 3–4 times as long as broad, spreading, close or rather spaced on the branches, 1-12th to 1-8th in. long, bright green, moderately firm in texture, the distinct midrib nearly central, the upper side but little dilated at the base and scarcely imbricated over the stem, obscurely ciliated; leaves of the upper plane $\frac{1}{3}$–$\frac{1}{4}$ as long, ovate cuspidate, much imbricated. Spikes square, $\frac{1}{2}$–1 in. long, $\frac{3}{4}$ lin. diam.; bracts crowded, ovate-lanceolate, acutely keeled.

Hab. In Queensland, at Rockingham Bay, and on the banks of the Daintree River, *Dallachy*! *Fitzalan*!

56. S. COMMERSONIANA Spring Mon. ii. 110. — Stems trailing, reaching a foot in length, convex on the back, bisulcate on the face, pinnately branched, the branches copiously compound. Leaves of the lower plane crowded, subrigid, bright green, a line long, half a line broad, oblong-lanceolate, very acute, subequilateral, the base on the upper side shortly ciliated, not dilated; leaves of upper plane ovate cuspidate, $\frac{1}{4}$ as long. Spikes very short, square; bracts ovate-lanceolate, crowded, strongly keeled.

Hab. Philippines, *Commerson*.

57. S. PLUMOSA Baker; *S. radicata* Spring Mon. ii. 114; *S. Roxburghii* Spring Mon. ii. 203; *S. prælonga*, *tetragonostachya*, and *pyrrhopus* Spring; *S. stolonifera* J. Scott, ex parte, non Spring; *Lycopodium plumosum* Linn. herb.; *L. tetragonostachyum* Wall.; *L. radicatum*, *prælongum*, and *Roxburghii* Hook. & Grev.; Dill. Musc. tab. 66, fig. 10. — Stems pale, trailing, $\frac{1}{2}$–1 ft. long, often forked low down, copiously pinnately branched, the branches copiously compound, the faces generally flat, the root-fibres extending to the upper nodes. Leaves of the lower plane contiguous on the branches, spreading or rather ascending, bright green, moderately firm in texture, oblong- or ovate-lanceolate, acute, 1-12th to 1-8th in. long, much more produced on the upper side of the distinct midrib, ciliated on both sides at the base, cordate on the upper side, and much imbricated over the stem; leaves of the

upper plane $\frac{1}{3}$ as long, ovate, cuspidate, much imbricated. Spikes copious, square, $\frac{1}{4}$–$\frac{1}{2}$ in. long, $\frac{1}{2}$–$\frac{3}{4}$ lin. diam.; bracts ovate-lanceolate, acute, strongly keeled.—Var. *S. monospora* Spring Mon. ii. 135; *S. rugulosa* Cesati; Dill. Musc. t. 66, fig. 8. Habit more robust, the branches more compound, the upper part of the stem assurgent, the root-fibres usually confined to the nodes of the lower half. Leaves bright green, $\frac{1}{8}$–$\frac{1}{6}$ in. long. — Var. *S. pallida* Spring Mon. ii. 116; *Lycopodium pallidum* H. & G. Leaves shorter, more ovate, pale green.

Hab. Eastern Himalayas, and Mountains of the Indian Peninsula and Ceylon; Birma and the Malay Isles; and extending to South China, San Cristoval, *J. G. Veitch*! and Vanecolla, *C. Moore*! I cannot separate by any definite character *S. biformis* A. Br. (Philippines, *Cuming* 2016!). *L. prælongum* H. & G. is a form with long flaccid trailing stems, flagellate at the end, and all the branches short; *L. tetragonostachyum* Wall., a dwarf suberect form with leaves between those of the type and var. *pallida*. Spring's Bonin plant, mentioned under *pallida*, is *S. boninensis* Baker. Var. *Hamiltoni* Baker (*S. semicordata* J. Scott Calc. List 63, non Spring) is a form of *monospora* with slightly dimorphous bracts, included by Wallich under the same number as Spring's plant.

(To be continued.)

ON *CUDRANIA TRILOBA* HANCE, AND ITS USES IN CHINA.

By FRANCIS BLACKWELL FORBES, F.L.S.

DR. HANCE first described *Cudrania triloba* in the 'Journal of Botany,' 1868, p. 49, from a specimen gathered in the interior of Shantung Province, North China, and amended his description later (Journ. Bot. 1876, p. 365), after Mr. Swinhoe had sent him specimens from Chefoo, also in Shantung. In 1877 I myself found the plant on the Fêng-wang Hills, near Shanghai (Kiangsou Province), and Dr. Hance made the following note on one of the specimens which he kindly determined for me:—"An unfortunate specific name, as the foliage seems very variable."

This remark is abundantly justified by the numerous specimens which I have since then collected at various places in the Shanghai district, as well as at Chefoo. The typical form is distinctly trilobate, with the central lobe sometimes twice as long as the lateral ones; but frequently unlobed leaves of varied outlines are also found on the same specimen. As far as I have been able to observe, the three-lobed forms occur principally in younger low-trailing plants, which also seem to be more spiny than the taller shrubs found in the same localities. As the plant grows, the tendency seems towards larger and entire leaves, with at the most an indistinct or irregular lobing, their general form comprising many variations between oblong and lanceolate, or even (more rarely) obovate and

emarginate. The growing shrub is easily recognised, notwithstanding this variety of foliage, but herbarium-specimens show other differences of texture and colour which are puzzling to anyone who looks at a series for the first time.

Common as this species is at Chefoo and Shanghai, M. Debeaux, who has published in the 'Actes de la Société Linnéenne de Bordeaux' "Florules" of both places, does not seem to have met with it himself at either. He quotes, however, in a supplement to his "Florule de Tchéfou" Dr. Hance's above-mentioned notice of Mr. Swinhoe's specimens, adding that in all the specimens of *C. triloba* in M. Franchet's herbarium, which came from Kiangsou, the leaves are "obliquement ovales." But it is difficult to see how the leaves even of any single specimen of this plant could be defined in M. Debeaux's words, or in any others equally simple.

I venture to add here a description of this species somewhat fuller than that which the material at the disposal of its eminent author enabled him to give originally.

Cudrania triloba Hance in Journ. Bot. 1868, p. 49. — Species polymorpha, frutescens decumbens v. frutex v. arbuscula 15–20 pedalis. Ramuli angulati v. striati, lenticellis sæpe notati, puberuli v. fere glabri, spinis solitariis axillaribus 3–12 lin. longis armati, in forma arborescente sæpius inermes. Folia alterna, 1–4½ poll. longa, medio ¾–2½ poll. lata, petiolo in forma frutescente 3–5 lineali, in arborescente 1–1½ pollicari, stipulis minutis; rotundata, rhombeo-ovata v. obovoidea, acuta obtusa v. leviter emarginata interdum mucronata, v. elliptica nunc basi rotundatâ acuta nunc utrinque attenuata; integra v. obscure et irregulariter lobata, sæpe distincte triloba, lobo intermedio longiore obtuso v. acuminato; utrinque scabriuscula v. pilosula demum glabrata, pilis in decursu nervorum magis persistentibus; subtus pallidiora, venulis purpureis v. rufescentibus creberrime reticulatis. Capitula sæpius (an semper?) geminata, 3–4 lin. diametro, pedunculis 2–4 linealibus. Fl. mas.: perianthii segmenta oblonga cucullata imbricata, bracteis 2 (?) cincta, per anthesin lutescente-alba, soluta; filamenta crassa subulata, basi segmentis adnata, antheris erectis breviter exsertis; ovarii rudimentum tenuissimum subulatum. Fl. fœm.: perianthii segmenta valde imbricata, post anthesin aucta carnosa; stylus indivisus filiformis, longe exsertus. Fructus ruber, mori mole; in pseudosyncarpio semina matura sæpius pauca; pericarpium globosum crustaceum stramineum, 1½–2 lin. diametro, stylo interdum superstite.

This plant has an economic interest specially on account of the use made of it by the Chinese in feeding silkworms. In May, 1881, M. Brunat, a French gentleman, who had gone to the silk-districts to purchase cocoons for the firm in which I was a partner, wrote to me in Shanghai from Wu-sieh (Kiangsou Province) about the rumoured complaints of a scant supply of mulberry-leaves. He stated, however, that he anticipated no deficiency of food for the silkworms in that (the Taysaam) district, as he was informed that they could be reared partly on leaves gathered from certain wild shrubs of the neighbourhood. He could not himself give a name

to these, but said that they certainly "n'avaient aucun rapport avec le mûrier." At my request he brought back to Shanghai good specimens of the shrub, which I at once recognised as *Cudrania triloba*. All were apparently from one plant, with rounded or oval leaves, hardly at all lobed, the female capitula in young flower with exserted styles.

The Chinese name for M. Brunat's specimens, given me by a native of the silk-districts, was *cha-shu*, while a small tree of the same species growing near my house in the Shanghai suburbs was named by my Chinese gardener *poh-hsi*. Local plant-names vary greatly in China, but, apart from this, neither of my informants would have liked to appear unable to answer my questions, so that I attach little value to the information in either case. My own conviction is that my specimens are to be referred to the *ché*, *nu-ché*, or *shih* tree, the notices of which in standard Chinese works have long been a puzzle to botanists.

For the following indication of references to this plant I am indebted to two papers published by Dr. Bretschneider in the early part of 1881.* I may remark that part of the difficulty in tracing the *ché* tree has doubtless arisen from its comparison in the Chinese works about to be quoted with the *tsoh* tree, which Dr. Hance† has identified with *Quercus mongolica* Fisch., and from the fact that the venerable sinologue, Dr. S. Wells Williams, misled by this comparison, calls the *ché* tree (Chinese Dict. p. 39) "the silkworm oak of China."

The 'Pen-tsao-kang-mu,' xxxvi., pp. 9, 10, 11, gives long descriptions of the *ché* and the *nu-ché*, the following abstract of which has been kindly prepared by my friend Mr. Donald Spence, of H. B. M. Consular Service :—

"Native authorities state that the *ché* prefers stony ground, and the *tsoh* hilly arable land. Hence it is that the etymological meaning of the character *ché* is "stone-tree." The *ché* wood is streaked inside, and may be worked on the turning-lathe into small articles. Its leaves are used for feeding silkworms, but it is also said that its leaves are hard and not so good as the mulberry. According to another author, the *ché* abounds everywhere among the hills, having leaves of a thick texture, round, terminating in a point. Silkworms are fed on these, and the silk so produced is employed in making lute-strings which give a clearer sound than the ordinary ones. Another author says that bowmen use this wood to tip their bows with; and that the tree affords a reddish yellow dye, called the *ché* yellow, which is used for the imperial garments. It is elsewhere stated that *ché* wood, to which has been applied a paste made of coal-dust and vinegar, can be dyed black in a single night.

"The *nu-ché* grows in the wild hilly country of Kiangnan. It resembles the *ché* tree, and has thorned nodes and persistent

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* "Notes on some botanical questions connected with the export trade of China," January, 1881; "On Chinese silkworm-trees," June, 1881; published in the 'North China Daily News,' Shanghai.

† "On the silkworm-oaks of Northern China." Journ. Linn. Soc. x. 487.

leaves. Another writer says that the *nu-ché* is like the *ché*, but smaller; and that its leaves, which resemble those of the *tsoh*, but are not so large, are used for feeding silkworms."

Both the *ché* and the *nu-ché*, according to the 'Pen-tsao-kang-mu,' have medicinal properties, but it is needless to quote here the detailed instructions for administering preparations of them to women troubled with constipation, flatulence, &c.

M. Isidore Hedde, in a report* published in 1848, says as follows, quoting partly from a translation from the 'Imperial Cyclopædia of Chinese Agriculture,' made by M. Stanislas Julien:—

"The *tché shou* or *tché* tree is celebrated in China for feeding the silkworms called "compagnards." It is a low tree with small leaves, rough to the touch, and in outline round terminating in a point; the branches bear spines, whence it is sometimes called the *tsé-tsang*, or thorny mulberry. The fruit, called *Kia*, resembles pepper. The leaves of the *tché* tree are alternate and numerous. The stem is slender and straight. The leaves are thick. An interval of a year must be allowed between two gatherings of leaves, otherwise they would contain properties noxious to the silkworms.

"The *tché* tree grows everywhere in the north. Its wood is hard and solid. Its bark is covered with fine serrated lines which bear a great number of white spines. Its leaves resemble those of the mulberry, but they are smaller and thinner. Their colour is of a pale yellow; the extremity is triangular. They are excellent for feeding silkworms. There is a variety of the *tché* tree, called the *nou-tché*."

The two plants are also figured in the 'Chi-wu-ming,' vol. xxxv., which I have examined at the British Museum, folio 46 being a drawing of the *ché* and folio 27 of the *nu-ché*. Both drawings are very characteristic in their rendering of the various forms of leaves, and a comparison with my specimens of *Cudrania triloba* shows beyond doubt that both represent this species. It is stated briefly in the Chinese text that the *ché* leaves can be used as food for silkworms, that the wood yields a yellow dye, and that the wild form, or *nu-ché*, is a small shrub. This latter is said to grow in Kiangsi Province, having prickles and large triangular leaves.

The plates in the 'Chi-wu-ming' show very little difference between the *ché* and the *nu-ché*, except that the latter has spines; and it may be inferred from the annexed descriptions that the *ché* is cultivated, since the *nu-ché* is spoken of as a *wild* variety. Among my own specimens of *C. triloba* are some taken from two small trees (male and female) which, with thousands of the ordinary native trees and shrubs, had been set out by the Foreign Municipal Council of Shanghai along their main suburban road. The leaves of these are larger and thicker than in the wild specimens, and are generally entire, though with slight lobings near the tips of a few, and with all the other varieties of form which characterise the species. Mr. Carruthers, who has examined all my specimens, is

* "Description methodique des produits divers receuillis dans un voyage en Chine," par Isidore Hedde. Chambre de Commerce, St. Etienne, 1848.

inclined to separate this form from *C. triloba* Hance, but I cannot help thinking that the greater luxuriance of the whole plant may fairly be accounted for by its having exchanged its home on the thin soil of the Kiangsou hill-sides for the rich alluvial earth of the Yangtze delta, where it has been long cultivated. There is in the Herbarium of the British Museum a corresponding specimen, collected by Sir George Staunton in 1793, in the western part of Shantung Province. Lord Macartney's embassy, to which Staunton was attached, traversed this province only along the line of the Grand Canal through an alluvial country, and there is therefore reason to suppose that his specimens were, like my own, gathered from a cultivated tree. I may add that my own observations have not enabled me to detect any differences between the wild and cultivated forms, as regards either flowers or fruits.

In the very valuable series of reports on silk-production issued by the Inspector-General of Chinese Maritime Customs in 1881, M. Kleinwachter, Commissioner at Chinkiang (Kiangsou) alludes to the *chê* or *shih* tree, which, following Dr. Williams, he calls "the silkworm oak of China." His information is evidently gathered entirely from Chinese works, and the two drawings appended to his report are by no means as faithful as those in the 'Chi-wu-ming,' to which I have already referred.

M. Isidore Hedde states in the paper above quoted that he had brought to France a growing *tché* tree, which had been obtained for him by a missionary in Chusan, but the plant perished before reaching Paris. I may here note that I saw last year, at the Jardin des Plantes, in Paris, a growing *Cudrania triloba*, about ten feet high, which, if my memory serves me, had been sent from Shanghai. Its leaves appeared to be generally entire, or only obscurely lobed.

As further bearing on the identity of the *chê* tree with Dr. Hance's species, some Chinese writers describe the *chê* fruit as resembling a mulberry, which the fruit of *C. triloba* certainly does. By others the *chê* seeds are said to be like pepper. In all the specimens I have examined the seeds are straw-coloured or light brown, so that this comparison seems to require some stretch of imagination, unless indeed the appearance of the seeds changes at a later stage. Finally, Rumphius (Herb. Amboin. V., p. 24) has described the Javanese *Cudrania* as furnishing a yellow dye; and on the theory of the *chê* tree being a species of the same genus, it is not surprising to find it used by the Chinese for the same purpose.

There is, it must be admitted, a certain vagueness in all the Chinese descriptions, which tempts one to think that the same plant which had been taken by one author as the *chê* tree may have been referred by another to the *nu-chê*. As regards the economical value of the species, the further most important question remains to be studied of how far the *chê* leaves are restricted by the Chinese to the rearing of the *wild* varieties of the silkworm, and to what extent they may actually be employed in producing the Wusieh cocoons, the excellent quality of which is well known to the silk-trade.

ON THE FLORA OF INNISHOWEN, CO. DONEGAL.

By H. C. Hart, B.A.

(Continued from p. 80).

Anemone nemorosa L.—Local, W. E. H.

Ranunculus heterophyllus Sibth.—Frequent, W. E. H. Very abundant from Fahan to Bridge-end and Burt, where the forms *R. peltatus* Fr. and *R. Baudotii* Godron occur, the former being common.

R. hederaceus L.—Common, but diminishing northwards.

R. sceleratus L.—Rare, W. E. H. Malin Estuary; Blanket Nook; near Burnfoot.

R. Flammula L. *R. Ficaria* L. *R. acris* L. *R. repens* L.

R. bulbosus L.—About Dunree and Leenane; probably not unfrequent.

Caltha palustris L.—Local, W. E. H. Between Fahan and Inch Road.

Nymphæa alba L.—Rare, W. E. H. Lough Inn in East Innishowen.

Nuphar lutea Sm.—Frequent, W. E. H. Lough Naminn.

‡*Papaver dubium* L.—Not unfrequent about Stroove and Greencastle; Doagh Island.

**Chelidonium majus* L.—Culmore, W. E. H.

†*Fumaria capreolata* L.—Fields at Malin Well, Dickie. At Ardmalin †*F. pallidiflora* and †*F. confusa* were both gathered.

†*F. officinalis* L.—Common.

Corydalis claviculata DC.—Abundant on banks by a roadside and on a thatched roof near Culmore, W. E. H.

Nasturtium officinale R. Br.—Common.

‡*Barbarea vulgaris* R. Br.—By the side of the stream between Bridge-end and Burnfoot; a very rare plant in North Donegal.

Arabis hirsuta Br.—Sandy ground about Greencastle.

Cardamine pratensis L. *C. hirsuta* L.

†*Sisymbrium officinale* Scop.—Frequent? At Knockglass, west of Malin; railway banks between Farland Pt. and Blanket Nook.

†*Sinapis arvensis* L.

Draba verna L.—Local about Greencastle, W. E. H.; between Buncrana and Fahan.

D. incana L.—Sandy ground by the sea between Buncrana and Fahan. This is an important addition to the Flora of Donegal; the plant occurs in Ireland on Ben Evenagh to the east of Lough Foyle, and on sand-hills below it; on mountains and sand-hills in Sligo and on Macgillicuddy's Reeks in Kerry. It might, therefore, have been expected to occur in Donegal, but it is remarkable that it has not been found on the mountains.

Cochlearia officinalis L. †*Capsella Bursa-pastoris* DC.

**Senebiera Coronopus* Poir.—Plentiful at Carrickabrahy Castle on Doagh Island, the only place in which I have seen it in Donegal; Moville and Greencastle Pier, W. E. H.

Cakile maritima Scop.—Frequent on the Lough Swilly side, at

Dunree and Dunaff; west side of Malin Head; Malin Estuary; Pollan Bay; on the east side at Culdaff, sparingly.

†*Raphanus Raphanistrum* L.

R. maritimus Sm.—Between Stroove and Innishowen Head, and at Innishowen Head; shore east of Dunaff.

Crambe maritima L.—"At Nonvany Point in the parish of Clonmary," Cyb. Hib. This should be Clonmany, but I have not yet reached this point, nor am I sure of its whereabouts, since this name is not in the maps, nor known to the people.

[*Reseda lutea* L.—A single plant at Greencastle on the shore of Lough Foyle, W. E. H.]

‡*R. Luteola* L.—Very rare. At Fahan and Inch Road; between Fahan and Buncrana by the railway; near the R. C. Chapel west of Malin; at Malin, Dickie.

Viola palustris L. *V. sylvatica* Fr.

V. Curtisii Forst.—Sandy shore at Culdaff; Doagh Island and on the opposite side of Malin Estuary, &c.

V. tricolor L.—Not unfrequent.

Drosera rotundifolia L.

D. intermedia Hayne.—Sparingly on a bog north of Slieve Snacht, and with the following; Culmore, Dr. Moore.

D. anglica Huds.—In a bog between Stoolary and Lough Inn in East Innishowen; Culmore, Dr. Moore.

Parnassia palustris L.—Glengivney, W. E. H. Plentiful there, the only place I met the plant in the district.

Polygala vulgaris L. and var. *depressa* Wend.—Common. The latter form is commonest about Innishowen Head, &c.

†*Silene anglica* L.—Between Greencastle and Stroove, W. E. H.; about Stroove. A weed in cultivated fields.

†*S. inflata* Sm.—Culmore, W. E. H.

S. maritima With.—Local, W. E. H. Dunaff Head; and many other places round the coast.

S. acaulis L.—Dunaff Head, very rare, and in one place only at 550 feet above sea level. I do not think it occurs elsewhere at so low an elevation south of the Shetland coast. Discovered here by Mr. C. Moore.

Lychnis Flos-cuculi Sibth.—Frequent.

L. diurna Sibth.—Rare. Coast at Ardmalin South, and near Malin Estuary.

‡*L. Githago* Lam.—Frequent, a colonist.

Sagina procumbens L.—Abundant.

S. apetala L.—Malin Head.

S. maritima With.—Frequent. Innishtrahull, Dickie.

S. nodosa E. Meyer.—Local, W. E. H. Near Malin R. C. Chapel, and at Ardmalin South; on Doagh Island and Leenane.

S. subulata Wimm.—Dunaff Head and on a headland about a mile south of Ardmalin South, on the west side of Malin Head, at 650 feet. I have not found it elsewhere in Donegal.

Honkeneja peploides Ehrh.—Stroove; Innishowen Head; Malin Head; &c. Frequent. A remarkably large and fleshy form grows on the shore below the coast-guard station at Ardmalin, in company

with *Mertensia maritima*. It has numerous persistent large lower leaves, an inch in width and from an inch to an inch and a half in length. The usual form in Ireland is destitute of these.

Arenaria serpyllifolia L.—Local, W. E. H. Greencastle.

Stellaria media L. *S. Holostea* L.

S. graminea L.—Abundant at Kilderry, W. E. H. A local plant in Donegal.

S. uliginosa Murr.—Common. At 1850 feet on Slieve Snacht.

Cerastium glomeratum Thuil. *C. triviale* Link. *C. semidecandrum* L.

C. tetrandrum Curt.—Culdaff, Dickie. Sandy ground between Buncrana and Fahan, and at Dunree; Malin Head.

Lepigonum rupicola Lebel.—Dunaff Head; coast about Malin Head and elsewhere.

L. salinum Presl. and *L. marinum* Wahlb.—Both forms are frequent. The latter especially so about Inch Road and Burnfoot where it is frequently a submerged plant in the heavy dykes.

Spergula arvensis L.

‡*Malva sylvestris* L.—Rare, W. E. H.; and probably not native. Only about cottages, but not unfrequent about Carndonagh.

Hypericum Androsemum L. *H. quadrangulum* L. *H. pulchrum* Leers.

[*H. perforatum* L.—I formerly inserted this plant in my N.W. Donegal list, but I fear it was a mistake. I have not noticed it recently, nor have I any recorded locality. It grows, perhaps, in the southern parts of the county, since it is recorded, without locality, in the 'Cybele Hibernica' from Donegal.]

H. humifusum L.—Frequent, W. E. H. About Culdaff, &c.

H. Elodes L.—Frequent, especially so about Malin Head.

(To be continued.)

SHORT NOTES.

Saxifraga pedatifida *Sm.* as a British Plant.—This species is one that has long been on the border-land of doubtful natives. Babington admits it in his earlier editions on the authority of Don from Clova and Wynne from Achill Island; but subsequently excludes it as probably of garden origin. Hooker relegates it to the "excluded species." Looking recently over a long-neglected parcel of duplicates in my herbarium, I found about a dozen specimens with this name, labelled as having been gathered in Achill Island in 1853 by the late Mr. W. Andrews. They were placed along with a number of other Saxifrages, all from the west of Ireland; and were undoubtedly given to my father by that gentleman, who used frequently to bring him Irish rarities. On comparing the plant with the type specimens, with the assistance of Mr. J. G. Baker, there was no doubt about referring it to this species; it appears to belong to the form *S. ceratophylla* of Aiton, distinguished by its rosette of somewhat rigid leaves. I have placed specimens in the National Herbaria at South Kensington and Kew. The distribution of the plant on the continent is very

restricted; Nyman gives it as "Gall. mer. (Lozère, Ardeche, Gard, Herault)."—Alfred W. Bennett.

On the Etymology of Vincetoxicum.—In the admirably clear and concise 'North American Flora,' of which it is to be hoped a further portion may shortly be issued, I notice that Dr. Gray gives the derivation of *Vincetoxicum* as "from *vinceus*, that which serves for binding, and *toxicum*, a poison, i. e., poisonous bindweed."* But this is surely a quite untenable etymology, as a reference to the few works of the Fathers which I am able to consult in my far-off home appears conclusively to show. Leonhart Fuchs, writing of the plant, in 1542, uses these words: "Ασκληπιὰς Graecis, Asclepias Latinis, herbariis Hirundinaria, officinis Vincetoxicum, Germanis Schvvalbenvvurtz, Gallis autem Domte venin appellatnr. . . . . Vincetoxicum vel rectuis νικητοξικόν, haud dubie dicta est quod illi insignis adversus venena vis sit."† In 1554, Matthiolus says of it: "Vis eis magna ex toluis similitudine substantiæ adversus omnia venena, unde illi nomen."‡ Dodonæus also, in 1583, remarks: "Facultate autem Vincetoxici radices calidæ sunt et siccæ: venenis adversari creduntur"; § whilst, at the same date, Cæsalpinus says: "Quidam hodie Vincetoxicum vocant, quia venena depellit."‖ As to *rinceus*, the fact appears to be that an unscholarly copyist, transcribing Plautus, misread the line,

"Nam mihi jam intus potione juncea onerabo gulam,"¶

and thus unwittingly endowed the Latin tongue with a word of his own creation. It occurs nowhere else in classical literature, and the Mai correct reading, given in the celebrated codex discovered by Cardinal in the Ambrosian library at Milan, is adopted by all recent editors. The above considerations will, I believe, establish beyond contest that the true etymology is from *vincere* and *toxicum*. —H. F. Hance.

Lycopodium alpinum in Co. Wicklow.—On the 31st of March last I gathered this species on the cliffs above Lough Ouler, near the summit of Tonelagee. There was but one small patch of it, at an altitude of 2340 feet above sea-level. The locality is close to that of *Alchemilla alpina*, which I discovered here and recorded in this Journal for 1873, p. 174. Neither of these species has been discovered elsewhere in the Wicklow mountains or in District IV. of the 'Cybele Hibernica.'—H. C. Hart.

Brachythecium albicans *Neck.* in Fruit.—This handsome moss, which is not often found in fruit, has, at Mr. H. Boswell's desire, been made an object of special search in South Bedfordshire

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* Synopt. Fl. N. America, ii. 102.

† De hist. stirpium comment. cap. 45. It is noteworthy that, after the lapse of three centuries and a half, *Dompte-venin*—a literal translation of the Latin name—is still the vulgar French appellation. (Cosson & Germain, Fl. de Paris, 252; Germain, Dict. de bot. *sub voce;* Bocquillon, Man. d'hist. nat. méd., 1099).

‡ Comment in libros Dioscoridis, ad libr. iii. c. 90. In the highly-valued edition of Dioscorides by Saracenus, this is given as c. 106 of the third book.

§ Stirp. hist. Pempt. iii. lib. iii. c. 19.

‖ De plantis, lib. vi. c. 72.

¶ Stichus, act. iv. 2, 56.

during the past winter. Many fruitless journeys were made, and scores of old thatched buildings were examined without success. Eventually on March 26th an old thatched shed in Harlington Brickfields was observed on which this moss was fruiting copiously. —J. Saunders.

Worcestershire Plants.—I am desirous of forming a Herbarium exclusively of Worcestershire plants, specimens of both common and rare species, with their varieties, being wanted from the four botanical districts (see 'The Botany of Worcestershire,' by Mr. Edwin Lees). At present I do not propose to collect any cryptogamous orders, excepting those enumerated in the London Catalogue, 7th ed.; viz., Filices, Lycopodiaceæ, Marsileaceæ, Equisetaceæ, and Characeæ. My own specimens chiefly represent the Malvern District, and to those botanists who collect in other parts of the county I should feel much obliged for assistance in forming the collection, which, I need hardly say, while in my possession, would be at the service of any who might wish to consult it. I should of course be pleased to supply, as far as I could, the wants of others from the plants of this neighbourhood. I should add that there are many Malvern and Teme Valley plants I also should be very glad of. My address is 2, Commercial Buildings, Malvern Link.—R. F. Towndrow.

NOTICES OF BOOKS.

Fragmente einer Monographie der Characeen. By A. Braun, edited by Dr. Otto Nordstedt. Berlin, 1882. 4to, pp. 211.

Die bisher bekannten Europaischen Characeen. By P. Sydow. Berlin, 1882. 8vo, 104 pp.

For many years the late Prof. A. Braun was collecting materials for a Monograph of the *Characeæ*, but unfortunately did not live to complete it. His notes, however, have fallen into most competent hands, and the present volume, under the editorship of Dr. Nordstedt, is the most important work that has appeared on the order. It is especially useful as clearing up Braun's work, and describing, or settling down, the very large number of plants to which he has given manuscript names in public herbaria.

The classification is mainly the same as that adopted in the Author's previous works; the number of genera has however been increased to five. Under *Nitella* 70 species are included, of which 17 are here described for the first time, *viz.*:—*monodactyla*, *polygyra*, *glomerulifera*, *prælonga*, *remota*, *Robertsoni*, *dispersa*, *pseudoflabellata*, *capitellata*, *pygmæa*, *Asagrayana* (Nordst.), *microglochin*, *conglobata*, *diffusa*, *polycephala*, *trichotoma* and *Lechleri*. Under *Tolypella* there are 8 species, of which *longicoma*, *apiculata* and *californica* are new. *Lamprothamnus* consists of only one species, *alopecuroides* (formerly included under *Lychnothamnus*). *Lychnothamnus* includes 3 species, *stelliger* (formerly under *Chara*), *macropogon* and *barbatus*. *Chara* includes 60 species, of which 11 are described for the first

time, *viz.*:— *Wallichii*, *succincta*, *Leptopitys*, *Griffithii*, *psilopitys*, *Thwaitesii*, *nudifolia*, *Schaffneri*, *altaica*, *infirma* and *leptosperma*, making in all 142 species. Some of these are stated as subspecies, but as they are not included under other species, and are numbered separately, and in all other respects treated as species, we think they must be intended to rank as such.

The new genus *Lamprothamnus* is based on the relative position of the globule and nucule, the former being above the latter, whereas in *Lychnothamnus* they are side by side. The removal of *Chara obtusa* (*C. stelligera* Bauer) to the genus *Lychnothamnus* is an important step, based upon Dr. Nordstedt's investigation of the development of the globule and nucule.

There are seven plates containing 273 figures, principally illustrating the new species. Dr. Nordstedt has added a key, which will no doubt prove very useful. A chapter is devoted to problems and queries, which contains suggestions of some of the important questions to be solved in relation to the order. The information as to the geographical distribution is a great advance on that previously published. There can be no doubt that this work is the result of an immense amount of investigation and very careful editing.

Dr. Sydow's work contains descriptions of the European *Characeæ*, with synonyms, and with localities for some of the rarer species, prefaced by a chapter on structure. It may prove useful to those who have not copies of Braun's and Nordstedt's papers, but it seems to contain little that is original, and following so closely after the publication of Braun's 'Fragmente,' it is noticeable that the systematic portion is little more than a compilation from the matter relating to the European species in that work and in Braun's account in 'Krypt. Flor. Schlesien.' The information as to distribution, which we think should be an important feature in a work dealing only with a limited area, is very incomplete, judging from that relating to our own plants: thus *C. ceratophylla* (*C. tomentosa*), *C. baltica* and *C. fragifera* are not recorded for Great Britain at all; *C. polyacantha* is given for England, but not for Scotland or Ireland; *N. translucens* is not given for Scotland, and *Tolypella glomerata* and *T. intricata* are not noted for Ireland, while *N. syncarpa* is recorded for England without locality or authority. The synonymy is very extensive, apparently for the most part copied from Braun, but is far from complete; we find, for instance, that under *Lamprothamnus alopecuroides*, the most important synonym, *Lychnothamnus alopecuroides* is omitted, whereas, under the same species, Braun has been followed in quoting seven utterly useless manuscript names.

H. & J. G.

The issue during the past month of the concluding part of Bentham and Hooker's 'Genera Plantarum' completes one of the most remarkable undertakings of modern times. It would be unnecessary, if not impertinent, to draw attention to the immense value of the work; but we may be permitted to offer to the illustrious authors our hearty congratulations on the satisfactory

termination of a task which lays all systematic botanists under great obligations to them. The following summary by Mr. Bentham of the number of phanerogamic plants known to science may be of interest :—

	Orders.	Genera.	Species (estimated).
Polypetalæ	82	2610	31,874
Gamopetalæ	45	2619	34,556
Monochlamydeæ	36	801	11,784
Gymnospermæ	3	44	415
Monocotyledons	34	1495	18,576
Totals	200	7569	97,205

We have received the 'Report of an exploration of parts of Wyoming, Idaho, and Montana' made by Lieut.-Gen. P. H. Sheridan in the autumn of last year. A list of the plants collected is added, in which we notice a new Gentian (*Gentiana Forwoodii* A. Gray—name only).

The Fifth Annual Report of the Erith and Belvedere Nat. Hist. Soc. contains a list of the Mosses of the neighbourhood, by Dr. A. S. Greenway.

Dr. J. Croumbie Brown has compiled a readable little volume entitled 'The Forests of England and the management of them in bye-gone times' (Edinburgh : Oliver & Boyd).

We have received the 'Boletim Annual' for 1880–1882, issued by the Sociedade Broteriana (Coimbra, 1883). It contains a localised list of the plants distributed by the Society, to which are added critical notes on some of the more interesting, with descriptions of *Pulicaria microcephala* Lange, and *Andryala Ficalheana* Daveau, species new to science.

Under the title 'Timehri,' the Royal Agricultural and Commercial Society of New Guinea is issuing a half-yearly journal, Mr. E. F. im Thurn being editor. In the second number, Mr. G. S. Jenman has some useful 'Remarks on the Aspect and Flora of the Kaieteur Savannah'; and there is also a letter from Dr. Schomburghk of Adelaide, giving some interesting autobiographical details.

Mr. William Trelease sends us a reprint from the Proceedings of the Boston Society of Nat. History of his paper "On the structures which favour cross-fertilization in several plants." A large number of observations upon numerous species are recorded, those upon *Lemna minor* being especially interesting.

Under the title 'Wild Flowers of Switzerland,' Messrs. Sampson Low and Co. have issued a handsome large quarto volume containing sixteen coloured groups of alpine flowers. Although not strictly botanical, the book will be useful to the many who wish to ascertain the names of the more striking plants met with in their rambles among the Alps. The flowers have been painted natural size, from living plants; each species stands out clearly, and the colouring is very careful. Each group is accompanied by an outline sketch, from which the names may be readily ascertained.

The letterpress, as far as it goes, is accurate ; and the book is above the average of such works. The authoress, Mrs. Ward, modestly conceals her name under the initials ' H. C. W.'

Messrs. Cassell have re-issued, at a very low price considering the goodness of the book, the adaptation of Figuier's ' Vegetable World ' for which Mr. Dyer is understood to be responsible, and which, as might be expected from this fact, is an exceedingly useful little volume. We reviewed it at some length in this Journal for 1872 (pp. 347–349), and need not do more now than endorse the favourable opinion there expressed. We note that certain small errors have been corrected. For the general reader it is a very useful volume, and the numerous and beautiful illustrations make it a very attractive one.

New Books.—J. v. Schroeder & C. Reuss, ' Die Beschädigung der Vegetation durch Rauch und die Oberharzer Hüttenranchschäden ' (Berlin, Parey). — Th. de Heldreich, ' Flore de l'Ile de Céphalonie ' (Lausanne, Bridel). — J. L. de Lanessan, ' Flore Générale des Champignons ' (Paris, Doin ; 8 fr.). — G. Sicard, ' Histoire Naturelle des Champignons' (Paris, Delagrave).

Articles in Journals.

American Journal of Science. — A. Gray & J. H. Trumbull, ' Review of De Candolle's ' Origin of Cultivated Plants.''

American Naturalist. — W. J. Beal, ' Movements of roots of Indian Corn in germination.' — J. G. Lemmon, ' Wild Potatoes of Arizona.'

Botanisches Centralblatt (no. 13). — C. Sanio, ' Additamentum secundum in Harpidiorum cognitionem.' — Nos. 14 & 15. M. Kienitz, ' Die Entstehung der ' Markflecke '' (2 plates). — No. 16. W. Hillhouse, ' Ueber den intercellularen Zusammenhang von Protoplasten.'

Botanische Zeitung (Mar. 23). — E. Warming, ' Botanische Notizen.' — (Mar. 30). E. Zacharias, ' Ueber Eiweiss, Nuclein und Plastin.'—(Ap. 6, 13, 20).—A. Fischer, ' Ueber die Zelltheilung der Closterien ' (1 plate).

Botaniska Notiser 1883, no. 1. — E. Adlerz, ' Studier öfver bladmossorna i jemtländska fjälltrakterna 1882.' — L. M. Neuman, ' Studier öfver Skänes och Hallands flora.' — No. 2.—C. Kaurin, ' Fornöden Berigtigelse.' — H. W. Arnell, ' *Sorbus Aucuparia* L., forma minor.'

Bull. Soc. Bot. France (xxix.; Session à Dijon).—C. Roger, ' Sur le tubercule de *Colchicum autumnale*.' — T. Chaboisseau, ' Sur les *Primula officinalis*, *P. grandiflora*, et leurs hybrides.' — Lucand & X. Gillot, ' Supplément au Catalogue des Champignons des environs d'Autun.' — X. Gillot, ' Sur quelques variations du *Pteris aquilina*.' — J. d'Arbanmont, ' Ramification des Ampélidées; vrilles et inflorescences.' — A. Chabert, ' Observations sur la Flore montagneuse du Cap Corse.' — E. Bonnet & J. A. Richter, ' Sur quelques plants de la Cote-d'or et les Basses-Pyrénées.'

Bulletin of Torrey Botanical Club (March). — G. Vasey, 'Three hybrid Oaks' (3 plates). — Id., '*Cyperus refractus* Torr.' — D. C. Eaton, 'New or little-known U. S. Ferns' (*Notholæna californica*, n. sp.). — F. L. Scribner, 'Grasses collected by Pringle in Arizona and California' (*Diplachne viscida*, *Poa Pringlei*, spp. nn.). — E. G. Knight, 'Submerged leaves in *Limnanthemum lacunosum*.'

Flora (Ap. 1). — L. Celakovsky, 'Ueber einige Arten resp. Rassen der Gattung *Thymus*.' — (Ap. 11). J. Velenovsky, 'Ueber die Traubenwickel von *Drosera rotundifolia*' (1 plate). — P. G. Strobl, 'Flora der Nebroden' (cont.).

Garden (March 31). — '*Dendrobium bigibbum*' (ic. pict.).

Gardeners' Chronicle (Mar. 31). — *Eria Elwesii* Rchb. f., *Rodriguezia Lehmanni* Rchb. f., spp. nn. — (Ap. 7). W. B. Hemsley, 'The Bermudas' (concluded). — *Calanthe Ceciliæ* Rchb. f., *Epidendrum Endersii* Rchb. f., spp. nn. — (Ap. 14). J. Attfield, 'Note on Sap.' — T. Moore, *Osmunda japonica*, var. *corymbifera*. — *Aerides lepidum* Rchb. f. *Cœlogyne chloroptera* Rchb. f., spp. nn. — J. G. Baker, 'Supplementary notes on *Cyclamen*.' — *Juniperus recurva* (fig. 69). — (Ap. 21). W. G. Smith, *Puccinia Buxi* (figs. 78, 79).

Journal of Linnean Society, xx. no. 127 (Ap. 16). — J. G. Baker, 'Contributions to the Flora of Madagascar; part ii., Monopetalæ' (many new species; four new genera—*Schismatoclada* (Rubiaceæ), *Tetraspidium* (Scrophulariaceæ), *Monochochlamys* and *Forsythiopsis* (Acanthaceæ),—each with a plate. A short summary will be found at p. 95).

Knowledge (Ap. 20). — Grant Allen, 'The Marsh Marigold.'

Magyar Növénytani Lapok. (March). — T. Schaarschmidt, 'Fragmenta Phycologiæ Bosniaco-Serbicæ I.' — V. Borbás, '*Inula Csatoi* and *I. hybrida*.' — L. Simkovics, '*Inula hybrida*.'

Midland Naturalist. — J. G. Ogle, 'Fertilization of *Saxifraga*' (1 plate). — W. B. Grove, 'Nomad Fungi: Reclassification of *Uredineæ*' (concluded). — J. E. Bagnall, 'Flora of Warwickshire' (contd.).

Nature (March 29). — Grant Allen, 'The Shapes of Leaves' (concluded). — (Ap. 5). F. M. Burton, 'Sap-flow.' — (Ap. 12). W. T. T. Dyer, 'Deductive Biology.' — (Ap. 19). W. B. Hemsley, 'On the relations of the Fig and the Caprifig.'

Naturalist. — J. G. Baker, 'On the present state of our knowledge of the Geography of British Plants.'

Œsterr. Bot. Zeitschrift. — L. Simkovics, '*Rosa reversa* W. & K.' — S. S. v. Müggenburg, 'Mykologisches.' — B. Blocki, 'Zur Flora von Galizien.' — V. v. Borbas, 'Synonymia Mentharum.' — J. Murr, 'Ins oberste Lechthal' (concluded). — P. G. Strobl, 'Flora des Etna' (contd.).

Pharmaceutical Journal (Mar. 31). — D. Morris, 'Cinchona Cultivation in Jamaica.' — (Ap. 7). W. A. H. Naylor, 'Bitter principle of *Hymenodictyon excelsum*.' — W. C. Ondaatje, 'Medicinal Plants of Ceylon.' — J. Attfield, 'Note on Sap.'

Science Gossip. — E. Malan, '*Orchis mascula*' (concluded). — C. F. W. T. Williams, 'Micro-Fungi Bathonienses.' — W. B. Grove, 'Notes on Schizomycetes' (contd.).

LINNEAN SOCIETY OF LONDON.

February 1, 1883.—Sir John Lubbock, Bart., F.R.S., President, in the chair. — Messrs. F. W. Burbidge and Joseph Johnson were elected Fellows of the Society. — The following paper was read:— "On the Structure, Development, and Life-history of a tropical epiphyllous Lichen," by H. Marshall Ward. The author's observations lead him to believe that the epiphyllous cryptogam in question supports the view that a Lichen is a compound organism composed of an Alga on which an ascomycetous fungus has become more or less intimately affixed and dependent. It is developed on the leaves of many plants, but it has been more closely watched on *Michelia furcata*. The Lichen presents four types,—orange-red stellate patches, greyish green blotches, clear grey spots, and white shining circles,—but these pass imperceptibly into one another, and vary in size from a speck to a quarter of an inch in diameter. The reddish spots of the earlier stages is an Alga, of which the radiating filaments are in part reproductive organs and in part barren hairs; it subsequently passes into the grey and green stages and by a modification of growth the invasion of a fungus mycelium succeeds. The white matrix of the complete Lichen consists of the same algal thallus invested by dense masses of the fungus hyphæ, which produce black dots, *viz*., the fruit-bodies. The author describes in detail the peculiarities of growth and reproduction of the Alga and fungus, and formation of the Lichen. He alludes to and criticises Dr. Cunningham's account of *Mycoidea parasitica*, which latter is evidently closely related to that described by himself. Assuming that *Mycoidea* and Ward's Alga are generically the same, either Cunningham discovered a female organ of reproduction, which becomes fertilized and produces zoospores, or he confounded this with fertile hair-organs. As regards the systematic position of the Algæ, a comparison with *Colæchæta* suggests that there is very little in common, beyond mode of growth, of the disk-like thallus and the production of zoospores from certain cells. The genus *Chroolepus*, moreever, presents features which agree in several important points, *viz*., orange-red oily cell-contents, habitat, production of zoospores in ovoid cells developed terminally and laterally. The structure of the thallus and relative positions of the main masses of fungal and algal portions agree with what occurs in heteromerous crustaceous Lichens, as *Graphidea*; but the perithecia indicate an angiocarpous alliance, bringing this form nearer such families as *Pertusaria* and *Verrucaria*, to the latter of which it may ultimately be referred.

February 15.—Sir John Lubbock, Bart., F.R.S., President, in the chair. — Mr. J. G. Baker read the third part of his "Contri-

butions to the Flora of Madagascar." This includes descriptions of the new Incompletæ and Monocotyledons contained in the collections lately received from the Rev. R. Baron and Dr. G. W. Parker. The only new genus is a Balanophorad much resembling in habit a compound *Sphæria*, which Sir J. D. Hooker proposes to cell *Cephalophyton*, but of which the material is still incomplete. A large number of the new species belong to widely spread tropical genera, such as *Ficus*, *Loranthus*, *Croton*, *Acalypha*, and *Peperomia*. In *Lauraceæ*, an order hitherto feebly represented in the island, there are several novelties. Types characteristic of the Cape and mountain regions of Central Africa are represented by *Faurea*, *Peddiea*, *Dais*, *Kniphofia*, and *Dipcadi*, one species each, and by three Aristeas and four Aloes. The *Dipcadi* is curious because, as in an Angolan species gathered by Welwitsch, the tails of the three upper segments grow longer and longer in the upper flowers of the raceme, till at the top the lamina is entirely absorbed. Of endemic types there are three new Obetias and two Tambourissas. The Bamboo of the forests of Imerina, now received from Dr. Parker for the first time in flower, proves to be the same species that is common in the interior of Bourbon. Of novelties nearly allied to north temperate types there are three species of *Bromus*, one of *Stipa*, and two Carices from the Ankaratra mountains, one near to *divisa* and the other to *ampullacea*.* A plant not in flower, with curious compound phyllocladia, is probably an *Exocarpus* allied to the Norfolk Island *E. phyllanthoides*. There is a third species of the new Alismaceous genus *Weisneria*, hitherto known in India and Central Africa; and a new species of *Centratherum*, a genus of grasses hitherto confined to India and China. Mr. C. B. Clarke has contributed a complete synopsis, with synonyms, of the species of *Cyperus* known in Madagascar and the neighbouring islands.— Mr. G. Murray read a paper "On the outer Peridium of *Broomeia congregata*." This gasteromycetous fungus, which is nearly related to *Geaster*, consists of a mass of individuals closely seated together on a corky stroma. These individuals have been found up till now with only one peridium, and the Rev. M. J. Berkeley, who first described the plant in 1844, treated the stroma as the homologue of an outer peridium. Mr. Murray has found on some specimens brought from Dammara-land by Mr. T. C. Een a true outer peridium common to all the individuals. From an examination of it he is able to throw light on the mode of development of this fungus. — Mr. W. B. Hemsley read a communication, "On the synonymy of *Didymoplexis*, and on the elongation of the pedicel in *D. pallens*." The latter saprophytic Orchid is widely scattered in Tropical Asia, though apparently nowhere very common. At the time of flowering the pedicels are shorter than the flowers, which are less than half an inch long; but afterwards they elongate, sometimes as much as a foot. The object seems to be to carry the ripening fruit clear of the wet decaying vegetable matter in which the plant grows.

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* Figures and descriptions of these Carices appear in the present number of this Journal.

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IN MEMORY OF GEORGE STACEY GIBSON, F.L.S.

By G. S. Boulger, F.L.S.

(With Portrait.)

That critical knowledge of local floras, which seems to become rarer as a general knowledge of Botany becomes more common, has sustained a serious loss in the death of George Stacey Gibson, which occurred on April 5th.

Mr. Gibson was born on July 20th, 1818, at Saffron Walden, the small town in the north-western corner of the county of Essex, in which he spent most of his life, and which he enriched by his numerous and munificent benefactions. He was the only child of Wyatt George Gibson and his wife Deborah, daughter of George Stacey, of Alton, Hampshire, his father's family being mainly from the North of England and connected with those of Middlebrooke, Johnson, and Atkinson, from the neighbourhood of Doncaster, Wilson of Kendal, and Wyatt, Mr. Gibson being lineally descended from Sir Henry Wyatt, the father of the poet. His branch of the Gibson family migrated into Essex, from Norfolk, about 125 years back; and, though another branch was previously settled at Great Chesterford, the great grandfather of the late author of the 'Flora of Essex,' George Gibson, for fifty-two years a minister of the Society of Friends, was the first of the family to live in Saffron Walden, coming there from Maldon.

Born to ample private means, though occupied during much of his life by the cares of a large business, and of many municipal, charitable, and religious institutions, Mr. Gibson seems to have imbibed at an early age a love of Nature, which, as in the case of many of his most eminent co-religionists, was mainly directed to Botany. He seems, when little more than twenty, to have become so well acquainted with our British flora that his keen powers of observation not only added many species to the list of Essex plants, but also detected several forms previously unknown in Britain. The following is a chronological list of the latter:—

1. *Cuscuta Trifolii* . 1842.	4. *Arenaria uliginosa* . 1844.
2. *Crepis setosa* . . . 1843.	5. *Galium Vaillantii* . . 1844.
3. *Filago spathulata*. 1843.	6. *Potentilla norvegica* . 1868.

Of these most were recorded in the pages of the first series of the 'Phytologist,' his contributions to which were as follows:—To vol. i. (1841–44), p. 408, 'A Flora of the Neighbourhood of Saffron Walden,' 1842, containing *Cuscuta Epithymum?* which afterwards proved to be *C. Trifolii*; p. 466, 'Additional Observations to a "Note on a supposed New British *Cuscuta*," by C. C. Babington' (*C. Trifolii*), January, 1843; p. 735, 'Rarer Plants observed near Weymouth,' August, 1843; p. 757, 'Rarer Plants observed near Weston-super-Mare,' August, 1843; p. 758, 'Rarer Plants found near Ventnor,' August, 1843; p. 770, 'Note on the New *Cuscuta*,' August, 1843; p. 817, 'Notice of a Visit to Black Notley,' by Joshua Clarke and

G. S. Gibson, October, 1843; p. 838, 'Supplement to the List of Saffron Walden Plants,' November, 1843, recording *Crepis setosa*; p. 902, 'Notice on a *Carduus* found near Saffron Walden,' January, 1843 (*C. dubius* Willd.); p. 996, 'Note on the *Primula elatior*,' May, 1844, asserting its specific distinctness; p. 1123, 'Additional Plants found about Saffron Walden during the Summer of 1844, with Remarks on some of the Species,' October, 1844, recording *Galium Vaillantii*. To vol. ii. (1845–47), p. 473, 'Botanical Notes for 1845,' containing records from Yorkshire and the Lake District; p. 676, 'Notice of some Localities of Plants in Cornwall, &c., in the 8th Month, 1846'; p. 269, '*Crepis setosa* and *Atriplex hortensis* near Saffron Walden,' September, 1847. To vol. iii. (1848–50), p. 216, 'Notice of the Discovery of *Filago Jussiæi* near Saffron Walden,' July, 1848, now known as *F. spathulata*; p. 308, 'Botanical Notes for 1848,' recounting visits to Box Hill, Bottisham and Burwell Fens, and Newmarket, August, 1848; p. 540, 'Mr. Newbould the discoverer of *Melilotus arvensis*,' April, 1849; p. 707, 'Botanical Notes for 1849,' October, 1849. And to vol. iv. (1851–53), p. 64, 'Botanical Notes for 1851,' February, 1851, recording plants from Dunoon (printed Durroun), Argyleshire. In the 'Botanical Gazette,' vol. ii. (1850), is a letter from Mr. Gibson to Henfrey on *Fumaria Vaillantii*. In 'English Botany Supplement,' 2890, *Arenaria uliginosa* is stated to have been found in 1848 by a party of four, but the actual discoverer is believed to have been Mr. Gibson. Lastly, the finding of *Potentilla norvegica*, in Burwell Fen, Cambridgeshire, in 1868, was recorded in our own pages (Journ. Bot. vi. (1868) p. 302).

In 1846 he communicated to Mr. Watson a list of West Cornish plants, which is incorporated into 'Topographical Botany,' where also records are acknowledged from Mr. Gibson for North Essex, Cambridge, East and West Norfolk, Surrey, West Sussex, North and South Devon, Monmouth, Radnor, Cardigan, Merioneth, Denbigh, North and West Yorkshire, Durham, and Perth.

As early as 1843, as we are told in the Preface, he "entertained the thought of compiling a Flora of Essex, and wrote to several botanists on the subject, among others to Edward Forster, from whom" he "learnt that he had already collected considerable materials for such a work, and had begun to arrange them. Finding the task in such good hands," says Mr. Gibson, "I gladly made over to him all the information which had come within my reach, and during the few latter years of his (Forster's) life we had frequent conversation and correspondence on the subject of his intended Flora. After his death, in 1849, no manuscript of this description was found among his papers, and therefore I was induced to resume the undertaking, for which material from various sources were gradually accumulated, till the appearance of the Floras of Suffolk and Cambridgeshire stimulated me to put them into shape for publication." Accordingly, in 1862, 'The Flora of Essex; or a List of the Flowering Plants and Ferns found in the County of Essex; with the Localities of the less common Species ascertained by recent observation and reference to former

Authors, and Illustrated with four coloured Plates of the Plants peculiar to the County, and a Map, small 8vo; pp. l. and 470, London,' was published by William Pamplin. Issued at six shillings, which can hardly have exceeded the bare cost of production, this work was a considerable expense to its author; but yielded him in return a well-merited scientific reputation as a local botanist. It was in several respects a distinct advance on preceding county floras. As had been done in the 'Flora Hertfordiensis' and 'Flora of Cambridgeshire,' he carefully traced the distribution in the county of common as well as of rarer plants; but he also searched and incorporated the work not only of Ray, but of most of his predecessors: he gave a table of the earliest and latest known observations of the less common species, and one comparing the flora of Essex with those of Suffolk, Cambridge, Hertford, and Kent; and he affixed biographies of four of his chief predecessors in Essex botany, Ray, Dale, Warner, and Forster, which are alike accurate and concise. The only great improvement in county floras established since the publication of this work has been the substitution of the division into river-basins for that into artificial districts.

Everyone who has followed in his steps in the study of our older botanical writers will fully endorse his remark that "the examination of these old works has produced a decided conviction that much care was exercised by" their authors, "both as regards descriptions and localities, and that they may generally be relied on." Unfortunately, though Mr. Gibson possessed an excellent general and botanical library of his own, without means of access to public collections, he was unable to render the early records in his book as complete as they might have been. Thus Turner is not quoted, Gerard and Johnson are somewhat confused, and some of Dale's observations credited to Ray. It is but fair to mention here, as is done by the author in his preface, the great assistance rendered to him, as to the writers of several other local Floras, by his friend, Rev. W. W. Newbould, who undertook excursions in several outlying districts to note localities, who searched the herbaria of Dale, Buddle, and others, corrected the proofs, "and added many critical notes," thereby greatly enhancing the accuracy of the work.

In 1845 Mr. Gibson married Elizabeth, daughter of Samuel Tuke, Esq., of York, and sister to the well-known physician. In 1847 he became a Fellow of the Linnean Society; but, after the publication of his Flora and the death of his father, other duties took him away from active scientific work. He nevertheless evinced to the last his deep sympathy with the multiform progress of knowledge. He was a skilful photographer, and took great interest in the progress of electric lighting; and among his many services to his native town was the promotion of the branch railway from Audley End. His father having, in 1830, discovered a number of human skeletons in his garden, Mr. Gibson in 1876 commenced a series of excavations which have resulted in the discovery of a most important series of remains belonging to the 9th or 10th century, underlaid by a prehistoric village of pit-dwellings, which will be described in a most interesting paper by Mr. H. Ecroyd

Smith, illustrated, at Mr. Gibson's expense, by twelve valuable plates, in the forthcoming part of the 'Transactions of the Essex Archæological Society.' Besides a good herbarium, including that of Lightfoot, he possessed an admirable collection of fossil shells from the Crag; and one of the chief occupations of the last three years of his life has been the re-arrangement of the very excellent local Museum of Natural History originally founded by him in conjunction with his uncle, Jabez Gibson.

In 1877 and 1878 he held the office of Mayor of Walden, and at the time of his death he was an alderman and J.P. for the borough, and senior partner of the firm of Gibson, Tuke, and Gibson,* whose banking-house is one of the chief ornaments of the Market Square, where also stands a handsome fountain erected by Mr. Gibson in commemoration of the Prince of Wales's marriage. He built a new Town Hall and several almshouses in the town; further endowed the Hospital founded by his father; gave thirty acres as a site for the Friends' School, of which he was Treasurer; and a site with the princely donation of £10,000 to the British and Foreign School Society's Training College. He was also a liberal contributor to the Free Grammar School and many other institutions, by no means exclusively those of the sect to which he belonged; and during the winter months frequently found work for the poor and unemployed. For many years he had presided, as "Clerk of the Yearly Meeting," over the conferences of the Society of Friends, and the very last act of his life was in connection with this office; since, acting as president during a long discussion on 'The Book of Discipline,' he aggravated an internal disease of long standing, and died, after five weeks' illness, at the Temperance Hotel, Bishopsgate Street, E.C., on April 5th, of inflammation of the kidneys.

He was buried on the 11th in the pretty little burial-ground behind the Friends' Meeting House, in his native town, being followed to the grave by about five thousand people, testifying to the general respect for one of whom it has been said that "he does not seem to have left a single enemy."

Small of stature and with a face in which several persons have been struck by a resemblance to Mr. Herbert Spencer, he was quiet and unobtrusive in manner. Seldom speaking until he had formed a matured opinion, he was an unusually "well-read" man, of wide culture and of sound judgment. Exact, punctual, cautious, and conscientious in an unusual degree, he was alike fitted to succeed in business or in scientific investigation. It has been written of him by those who knew him personally that "the blending of intellectual and moral qualities made him what he was. He grudged no amount of costly or toilsome research to verify a fact or arrive at the true understanding of anything with which he had to deal. His unbounded liberality was never indiscriminate: he

* He was thus one of the remarkable number of botanists for whom we are indebted to the banking profession, among whom have been Dawson Turner, William Borrer, Edward Forster, and the present President of the Linnean Society, the two last members of one firm.

would never pay more for anything than what he considered its true value, and he never gave to any object as to which he was not perfectly satisfied. Few men of equal wealth can ever have taken as much pains to dispose of it rightfully, and the extent of his private charities will never be known. Plain-spoken, he was yet considerate for the feelings of others, and would interest himself in their behalf as completely as in his own affairs. So punctual was he in keeping engagements that at a meeting at which he chanced to be two minutes late it was concluded that he had been altogether prevented from attending."

As a botanist he may not have had any wide knowledge of continental forms; but with characteristic modesty he submitted all the discoveries to which his acute powers of observation led him to the judgment of his friends, Mr. Borrer, Mr. Forster, and Professor Babington.

For much that I am here able to say of him I am indebted to his friends, Joshua Clarke, Esq., J.P., F.L.S., R. M. Christy, Esq., and the Rev. W. W. Newbould; but interested as I am in the Essex flora, it gives me much pleasure in being able to add my mite of admiration for one who must undoubtedly take high rank among the pioneers of the modern critical study of British plants.

NEW CHINESE *CYRTANDREÆ*.

By H. F. Hance, Ph.D., F.L.S. Memb. R. Soc. Ratisbon, &c.

When, in 1861, Mr. Bentham published the 'Flora Hongkongensis,' the *Gesneraceæ*,—all belonging to the tribe *Cyrtandreæ*,—known from the vast empire of China, were but three in number; *Æschynanthus acuminata* Wall., *Chirita sinensis* Lindl., both from the extreme south, and *Boea hygrometrica* R. Br., from the Peking mountains. Five years later, the present writer was enabled* to add four species to these, *Didymocarpus oreocharis* (now *Oreocharis Benthami* C. B. Clarke), *Chirita anachoreta*, *Chirita? macrosiphon*, a somewhat doubtful plant as to position, all from the province of Kwang-tung, and *Boea Swinhoii*, a Formosan undershrub; and again, seven years subsequently, he recorded† the existence in the mountains of northern China of a plant which he supposed to be identical with the North-west Indian *Didymocarpus lanuginosa* Wall., but which Mr. Bentham has since referred to *Oreocharis*. In 1872 M. Maximowicz reviewed the Japanese and Chinese *Cyrtandreæ*‡, falling into the same error with the writer as to the identity of the North Chinese plant with the Kashmir species (and, indeed, they are outwardly indistinguishable); but he only added one to the Chinese list, *Isanthera discolor*, gathered by Oldham in Formosa.

* Ann. Sc. Nat., 5e sér., v. 230.
† Journ. Linn. Soc. xiii. 85.
‡ Mel. Biolog. Acad. St. Pétersb. ix. 368.

Finally, in 1875, Mr. S. Le Marchant Moore recorded the Japanese *Lysionotus pauciflorus* Maxim. from Kiu-kiang, and described a new plant from the same locality, under the name of *Didymocarpus Auricula**,—but which Mr. Clarke informs the writer is either referable to *Oreocharis*, or perhaps *sui generis*,—thus bringing up the Chinese numbers of the order to eleven.

The exploration by the Rev. B. C. Henry, one of the most assiduous and successful investigators of the Kwang-tung flora, of the lovely and romantic regions of the Lien-chau River, has now brought to light eight other species, of which diagnoses are subjoined, a few of them unfortunately drawn up from incomplete specimens. Mr. Clarke also reports an undescribed *Chirita*, collected by the late Mr. Swinhoe at Amoy, so that, within a period of twenty years, the number of Chinese *Cyrtandreæ* known has been increased more than six-fold. The occurrence of eight new species of one group, all collected by a single person, within a limited region, shows the extraordinary richness of the flora, and the great amount of interesting novelties still awaiting discovery, as the area of exploration is enlarged.

In concluding these brief remarks, the writer desires to record his opinion that *Cyrtandreæ* have at least as good (or as little) a claim to separation from *Gesneræ* as *Vacciniaceæ* have from *Ericaceæ*; and that he thinks the Cyrtandreous genera require subdivision, if they are to be—as they should —considered equivalent to those of the American sub-order. They do not seem to have been quite satisfactorily dealt with in the 'Genera.'

1. **Oreocharis ? filipes,** sp. nov. — Radice tenui lignosa descendente, foliis radicalibus oblongo-obovatis integerrimis utrinque obtusis supra vivide viridibus tomento derasili floccoso primum tectis demum glabratis subtus densissime fulventi-pannosis venis utrinque omnino inconspicuis subpollicaribus 3 lin. latis petiolo pannoso 3-lineali, scapis filiformibus tenuissimis glaberrimis arcuato-recurvis circ. 2 poll. longis apice umbellatim trifloris, calycis 5-partiti laciniis angustis acutis, corolla ?, capsula lanceolata acuminata glaberrima 3 lin. tantum longa.

Sub rupibus impendentibus, ad angustias Yeung-tin, fluvii Lien-chau, 290 m. p. a Cantone, d. 12 Oct. 1881, coll. rev. B. C. Henry. (Herb. propr. n. 22137.)

Although there is but a single calyx without corolla, and a capsule on all the specimens gathered, so that I have been unable to examine the floral structure, yet the habit of this pretty little plant makes me feel almost sure that it is referable to *Oreocharis*.

2. **Didymocarpus** (Orthobœa ?) **demissa,** sp. nov.—Caudice brevi crassiusculo, foliis radicalibus elliptico-oblongis integerrimis acutis utrinque dense hirsutis 2-pollicaribus in petiolum pollicarem sensim angustatis, scapis foliis superatis pilis septatis villosis apice 3–5-floris, pedicellis 2 lin. longis, calycis 2½ linealis 5-partiti laciniis lineari-subulatis villosis, corollæ albidæ e tubo gracilescenti superne modice ampliatæ extus tomentosæ pollicaris lobis oblongis

* Journ. Bot. 1875, pp. 229, 231.

obtusis ciliatis, genitalibus faucem attingentibus, staminibus 2, ovario lineari tomentoso stylo tomentello eo duplo longiore coronato, stigmate cupulato.

In rupibus juxta Sai-ngau, ad fluvium Lien-chau, 210 m. p. a metropoli australi, d. 5 Oct. 1881, detexit rev. B. C. Henry. (Herb. propr. n. 22142.)

A pretty, delicate little plant, quite distinct from any known to me, of which I must add that my diagnosis is drawn up from a solitary specimen, with only two flowers, from one of which the corolla has fallen.

Petrocodon, genus novum.

Calyx 5-partitus, segmentis lineari-subulatis. Corollæ urceolato-campanulatæ lobis 5, triangularibus, acutis, erectis. Stamina 2, juxta imam corollam inserta, faucem vix attingentia; antheræ liberæ, breviter oblongæ, loculis parallelis apice confluentibus. Staminodia nulla. Ovarium liberum, oblongum, biloculare, placentis bilobis, stylo ovario æquilongo, stigmate punctiformi. Capsula linearis, bivalvis, valvis utrinque solutis medio placentiferis. Semina minuta, fusiformia, subtiliter tuberculata, utrinque breviter appendiculata. Herba acaulis. Folia radicalia, petiolata. Scapi laxe cymiferi, multiflori.

Didymocarpo, ut videtur, proximus; ast, corollæ forma, genericam dignitatem omni jure postulat.

1207 3. **P. dealbatus.**—Radice crassiuscule-fibrosa, foliis in sicco coriaceis oblongis acutis basi cuneatis margine leviter undulatis penninerviis costa nervisque subtus paulo prominulis 3–6 poll. longis 1–2 poll. latis petiolo 1–2-pollicari supra glabratis subtus præcipue secus costam petioloque passim pilis quasi induratis concretisque albo-furfuraceis, scapis folia parum superantibus albido-hirtis, floribus viridulo-albis, pedicellis 3–4 lin. longis hirtis, bracteis bracteolisque linearibus hirtis, calycis segmentis hirtellis lineam longis, corolla 3 lin. longa, capsula pollicari glaberrima stylo brevi coronata.

Juxta Tsing-lin, secus fl. Lien-chau, 230 m. p. a Cantone, d. 8 Oct. 1881, e rupibus decerpsit rev. B. C. Henry. (Herb. propr. no. 22123.)

1208 4. **Æschynanthus** (Haplotrichium) **apicidens,** sp. nov.—Caule crassiusculo angulato cortice cinereo suberoso glaberrimo tecto scandente ramos angulatos glaberrimos edente, foliis glaberrimis siccitate rigidis oblongis utrinque obtusiusculis apicem versus utrinque 1–2-dentatis costa supra impressa subtus elevata penninerviis nervis subtus tantum ibique obscure perspiciendis 1½–2 poll. longis 5–7 lin. latis petiolo 2-lineali supra hispido, floribus ad apices ramorum sæpe sursum trichotomorum 2–3 fasciculatis pedicellis gracilibus 1–1½-pollicaribus fultis, corolla ... ?, capsula gracili minute pustulata 2½–3½ poll. longa calyce 5-fida 1½-lineali laciniis lanceolatis apice ciliatis cincta, seminibus (inclusis pilis) circ. lineam longis cinnamomeis levibus.

In monticulo umbrato juxta pagum Tai-ping, 309 m. p. a Cantone, secus fl. Lien-chau, supra rupes strato humi parco tectas copiose scandentem, d. 19 Oct. 1881, detexit rev. B. C. Henry. (Herb. propr. no. 22056.

208? 5. **Chirita eburnea,** sp. nov.—Caudice abbreviato lignoso 1 poll. diametro rosulas foliorum ex apice lateribusque emittente, foliis confertis crasse carnosis ovalibus integerrimis acutis supra læte viridibus pubentibus subtus dense appresse tomentosis pilis omnibus septatis nervis crassiusculis supra impressis subtus paulo prominulis ad 6 poll. longis 3 poll. latis petiolis brevibus supra planis subtus convexiusculis basi connatis 9 lin. latis, pedunculis axillaribus solitariis scapiformibus pubentibus folio paulo brevioribus vel eo triplo longioribus, cymulis 10–25 floris basi bracteis 2 ovatis acutis tomentosis basi connatis fultis, floribus cernuis in exemplaribus paucifloris 2 centralibus pedicellis pollicaribus suffultis ebracteolatis e lateralibus centrali pedicellato ebracteolato reliquis subsessilibus singulo bracteola lanceolata tomentosa stipato, calycis ad basin fissi cum pedicellis pilis septatis setaceo-acuminatis purpureis aliisque flavo-capitatis obsiti laciniis lineari-lanceolatis 7 lin. longis, corollæ extus breviter rubello-glandulosæ intus glabræ sensim ampliatæ sesquipollicaris eburneæ intus lineis paucis pallide rubellis pictæ maculaque glandulosa aurantiaca ad lobos 2 superiores notatæ lobis oblongis obtusis, staminum faucem attingentium filamentis albis glandulosis antheris flavidis dense barbatis cohærentibus, staminodiis filamentis duplo brevioribus paulo recurvis glandulosis, disco cupuliformi, stylo exserto apice deflexo cum ovario tomentoso et glanduloso, stigmate bilamellato, capsula compressa bipollicari.

Juxta Sai-ngau, secus fl. Lien-chau, provinciæ Cantonensis, d. 5 Oct. 1881, invenit rev. B. C. Henry. (Herb. propr. no. 22129.)

Of this beautiful species a plant dug up and potted by Mr. Henry flowered with me at the end of August, 1882, and I have carefully drawn up the above character from it, as well as from the dried wild specimens, which have much longer many-flowered peduncles.

It is well distinguished by its stout columnar stem, only $2\frac{1}{2}$ inches high in the living specimen now before me, which sends out leaf-shoots just in the manner of *Cycas revoluta* Thunb. It is, I think, most nearly allied to *C. sinensis* Lindl.

209? 6. **Chirita Juliæ,** sp. nov.—Acaulis, foliis crassiusculis molliter velutinis ovalibus irregulariter grosse dentatis penninerviis nervis supra impressis subtus fortiter prominulis circ. $2\frac{3}{4}$ poll. longis 2 poll. fere latis petiolo semipollicari dense tomentoso supra plano subtus convexo, floribus plerumque binis pedunculo communi semipollicari pedicellisque 3-linealibus hirsutis fultis, bracteolis binis lineari-subulatis hirsutis, calycis ad basin usque fissi laciniis lineari-subulatis hirsutis 5–6 lin. longis, corollæ extus tomentellæ intus parce glandulosæ sensim ampliatæ tubo extus albido intus cæruleo-venoso lobis obtusis violascenti-cæruleis macula citrina inter duos superiores notatis, genitalibus faucem attingentibus staminibus medio tubo insertis filamentis parce glandulosis antheris albidis breviter barbatis, staminodiis brevibus recurvis, ovario styloque tomentosis stigmate bilamellato.

Secus fl. Lien-chau, prov. Cantonensis, m. Octobri 1881, sterilem detexit rev. B. C. Henry. (Herb. propr. no. 22077.)

A remarkably pretty species, the flower a good deal like *Barleria*

cristata in colour and marking. A transplanted specimen flowered with me in June, 1882, and from this I have drawn up my character. I have named it after Mr. Henry's eldest daughter, a sweet little girl, and the frequent companion and assistant in his fruitful botanical explorations.

2209 7. **Bœa dictyoneura,** sp. nov.—Caudice brevi robusto, foliis approximatis coriaceis oblongis acutis basi attenuatis margine irregulariter denticulatis supra oliveceo-viridibus nervis inconspicuis arachnoideo-floccosis demum glabratis subtus fulventi-pannosis nervis venisque reticulatis conspicue elevatis 5–7 poll. longis ad 2 poll. latis, pedunculis folio paulo brevioribus dense fulventi-floccosis, cymis condensatis multifloris, bracteis oblongis fulvo-floccosis, calycis 5-partiti segmentis linearibus obtusis dense floccosis 2 lin. longis, corolla 3 lin. longa 5-loba, staminum brevium filamentis incurvis crassiusculis antherarum loculis divergentibus apice confluentibus, ovario oblongo glaberrimo, stylo brevi, stigmate punctiformi, capsula 8 lin. longa.

Secus fl. Lien-chau, prov. Cantonensis, m. Maio 1881, leg. rev. B. C. Henry. (Herb. propr. no. 21741.)

This fine species, of which my specimens are not in fully developed flower, appears closely allied to *B. flocculosa* C. B. Clarke.* It lived with me for many months, but died without blossoming, being attacked by a species of *Coccus*.

Primulina, genus novum.

Calyx lageniformis, ultra medium 5-fidus, segmentis lanceolatis. Corollæ hypocraterimorphæ tubus cylindraceus, lobis 5, oblongis, paulo inæqualibus, patentibus. Stamina 2, imo tubo inserta; filamentis brevibus; antheræ liberæ, loculis divaricatis. Staminodia nulla. Discus nullus. Ovarium liberum, breve, oblongum, biloculare, placentis bilobis; stylas vix ovario longior, stigmate bilamellato. Herba acaulis. Folia radicalia, petiolata. Scapi apice umbellatim 3–5 flori.

Genus, habitu floribusque *Primulam* mire simulans, a *Didymocarpo*, *Oreocharide* et *Chirita*, corollæ forma facile distinctum.

2210 8. **P. Tabacum.**—Radice fibrosa, foliis carnosulis orbiculari-oblongis obtusis margine lobulatis basi leviter cordatis pilosis subtus glandulosis nervis supra impressis subtus fortiter elevatis 2–2½ poll. longis petiolo crasso supra plano subtus convexo apice v. per totam longitudinem marginato 2½–3½ poll. longo fultis, scapis petiolo circ. æquilongis pilosulis ac glandulosis 3–5 floris post anthesin arcte recurvis, floribus breviter pedicellatis bracteis binis linearibus glandulosis 3 lin. longis fultis, calycis nigro-glandulosi 4 lin. longi segmentis glanduloso-denticulatis, corollæ tubo extus albo-purpurascente pilosulo et glanduloso intus glanduloso-piloso 6 lin. longo lobis oblongis obtusis ciliatis apicem versus denticulatis pulchre purpureis medioque stria longitudinali saturatiore pictis 4 lin. longis, filamentis antheris circ. æquilongis.

Ad angustias Tai-li, secus fl. Lien-chau, 270 m. p. a Cantone, d. 10 Oct. 1881, leg. rev. B. C. Henry. (Herb. propr. no. 22094.)

* Commelyn. et Cyrtandr. Bengal. t. 83.

This pretty little plant is very delicate, and exceedingly troublesome to rear in cultivation. I have only had a single flower to examine. It is so wonderfully like a *Primula*, even when in blossom, that it was only dissection which showed me it was a *Gesneracea*. Mr. Henry says that, when alive, the glandular pubescence exhales a powerful odour of tobacco, which it communicates to the hands of anyone touching it, and that it is universally known to the natives by the name of *Shek-in*, that is 'Rock Tobacco.'

ON THE FLORA OF INNISHOWEN, CO. DONEGAL.

By H. C. Hart, B.A.

(Continued from p. 152).

**Acer Pseudo-platanus* Huds.—Grows naturally on the walls of Derry, Dr. Moore, Ord. Sur. Rept.

Geranium dissectum L. *G. Robertianum* L. *G. molle* L.

Erodium cicutarium Sm.

Linum catharticum L.—Abundant.

Radiola Millegrana Sm.—Near the Signal tower, Malin Head, where it was noticed by my brother, G. V. Hart; also a little east from Ardmalin cottage.

Ulex europæus L.

[*U. Gallii* Planch.—The Dwarf Furze does not occur in Innishowen, and I am a little doubtful about its being a Donegal plant. Stunted *U. europæus* may have been mistaken for it; it is, at any rate, very rare.]

Sarothamnus scoparius Koch.

Ononis arvensis L.—Buncrana, W. E. H. I could not find it there in Sept. 1882. This plant is recorded, without locality, from Donegal in the 'Cybele Hibernica.' I have never been able to meet with it.

Medicago lupulina L.—Rather scarce.

Anthyllis Vulneraria L. Common.

†*Trifolium pratense* L.—Common.

T. repens L.—Common. The native situation of these two clovers appears to me very distinct in Ireland. The present species thrives in damp or even very wet ground, either by the sea or to a considerable height on mountains, while *T. pratense* always looks most at home on dry banks and bluffs by the seaside. Red clover is more doubtfully native in the north west than the Shamrock. *T. repens* is commonly pink in salt marshes, where it resembles *T. fragiferum*. Some botanists believe neither species indigenous to Ireland.

T. medium L.—Local, but quite a characteristic plant in Innishowen, where I have observed it in the following localities:—between Kilderry and Slieve Snacht; Dunaff Head; Leenane; sandy ground at Ardmalin South, on the west side of Malin Head; at Knockglass, west of Malin, and at Goorey, by the school-house. I have found it also in Northern Donegal at Arranmore.

T. arvense L.—Sandy fields at Stroove, a little south of Innishowen Head, W. E. H. Sandy ground at Ardmalin South, on the west side of Malin Head.

T. minus Sm.—Frequent.

T. procumbens L.—Frequent, especially on dry sandy banks near the sea.

Lotus corniculatus L.—Abundant.

L. major Scop.—Near Fahan and between Fahan and Inch, apparently scarce.

**Vicia hirsuta* Koch.—More frequent in Innishowen than I have observed it elsewhere in Ireland, especially in cultivated fields from Glengad Head northwards, and about Carndonagh; about Fahan and Inch.

V. sylvatica L.—In a glen behind Moville, W. E. H. Culdaff, *Flor. Ulst.* Owing to a misprint in the 'Cybele Hibernica' I did not observe that this plant has been recorded from Hornhead by Mr. C. Moore; it must occur there in small quantities, since I have frequently botanized over Hornhead without meeting it. It also occurs in this county near the town of Donegal, Dickie.

V. Cracca L. *V. sepium* L.

V. angustifolia Roth.—Very rare. Leenane, Lough Swilly, is the only station I have seen it at in Donegal.

V. lathyroides L.—Dunaff Head and sandy ground at Stroove.

Lathyrus macrorrhizus Wimm.—Scarce.

L. pratensis L.—Stroove, &c. Not common in the north of Donegal.

Prunus communis Huds.—Common.

P. Padus L.—"Mentiagh Glen and Innishowen, Donegal," Cyb. Hib.

†*P. Cerasus* L.—"In the townland of Muff, Donegal," Cyb. Hib.

Spiræa Ulmaria L.—Common.

Geum urbanum L.—Frequent; at 500 feet on Crockanglirim.

Agrimonia Eupatoria L.—Local, W. E. H. Glengad Head; at Knockglass, west of Malin.

Alchemilla vulgaris L.—Common. *A. subsericea* occurs near Culdaff, on a headland a little south.

A. arvensis Scop.—Frequent.

Potentilla anserina L.

P. reptans L.—Not unfrequent; plentiful about Fahan, &c.

P. Tormentilla Nestl.—Abundant; at the summit of Slieve Snacht, 2019 feet.

[*P. Fragariastrum* L.—Probably frequent. I was too late in the year to determine its range.]

Comarum palustre L.—Frequent, especially about the mountain lakes, as at L. Naminn and L. Fad.

Fragaria vesca L.—Common.

Rubus Idæus L.—Not uncommon, W. E. H. Plentiful in the glen of Straid river.

R. saxatilis L.—Rare. Sparingly upon Bulbein Mount; on a headland about a mile south of Ardmalin South, on the west side of Malin Head; on Crockaughrim.

R. fruticosus L.—Abundant. As far as I was able to identify these forms of brambles from Babington's Manual, I met with *R. macrophyllus*, *R. incurvatus* and *R. cillicaulis* from Glengad Head northwards; *R. discolor* and *R. carpinifolius* frequent; while another form occurs on the south side of the Scalp. Innishowen appeared to me a good field for a student of Rubi. Dr. Moore has recorded *Rubus rhamnifolius*, *R. Kochleri* and *R. humifusus* from the neighbourhood of Derry; Ord. Surv. Rept.

R. cæsius L.—Banks by the side of the Foyle above Derry. Dr. Moore, Ord. Surv. Rept.

Rosa canina L.

R. tomentosa Sm.—Frequent.

‡*R. rubiginosa* L.—Near Derry, W. E. H. Probably introduced.

R. spinosissima L.—Local, W. E. H. Malin Head, Glengad, &c. Not common.

Cratægus Oxyacantha L.—Frequent. A handsome form, with remarkably large leaves and stipules, occurs by the shore at Culdaff; native about Goorey, west of Malin.

Pyrus Aucuparia Gærtn.—Frequent, at sea-level a little north of Culdaff Bay.

Lythrum Salicaria L.—Frequent.

Peplis Portula L.—Rare about Culdaff, Dickie. Plentiful about Ardmalin South, on the west side of Malin Head; at Loughinn River, near the lake, where it occurs as a floating or submerged plant.

Epilobium angustifolium L.—Ravine at Glennagiveney, Dickie. About a mile west of Glennagiveney, on cliffs above the sea far from habitations, and apparently native. The only satisfactory locality I have seen in the county.

E. hirsutum L.—Leenane. A very scarce plant in Donegal.

E. parviflorum L.—Very sparingly at Glennagiveney, W. E. H. By a pond at Carrickabrahy, Doagh Island; plentiful about Fahan, Inch Road, Bridge-end, Burnfoot, and Burt. This species is very locally distributed and stunted in Donegal.

E. montanum L.—Frequent, at 800 feet on Crockaughrim.

E. obscurum Schreb.—Generally distributed, W. E. H.

E. palustre L.—Common. Remarkably abundant in dykes upon the reclaimed land near Inch Road Station.

Circæa lutetiana L.—Frequent in suitable places.

C. alpina L.—Muff Glen and Innishowen Head, Flor. Ulst.

Myriophyllum spicatum L.—Deep ditches south of Burnfoot, in several places. This and the following appear to be confounded in the 'Flora of Ulster.'

M. alterniflorum DC.—Common, especially in ditches about Burnfoot and Blanket Nook, where the last also occurs; in the mountain lakes at the Mintiaghs; Lough Inn, in East Innishowen.

Hippuris vulgaris L.—Scarce. Marshy places on Doagh Island.

Montia fontana L.

Sedum Rhodiola DC.—Inland on Bulbein Mount, and Crockaughrim; Dunaff Head, Malin Head, Innishowen Head, Glengad Head, and Binnion.

S. anglicum Huds. *S. acre* L.

Cotyledon Umbilicus Huds.—Common.

Saxifraga oppositifolia L.—Abundant on Bulbein Mount, where it was discovered by Robert Brown. It does not occur on the other Innishowen mountains, and the record in the 'Flora of Ulster' is confusing. Mr. Templeton's record is simply "Bulbein Mount, R. Brown."

S. umbrosa L.—At Knockglass, Malin, close by the sea, and not more than 400 feet above its level, rare and barren, Dickie.

S. tridactylites L.—Local. Sandy coast about Greencastle, W. E. H.; sandy pastures between Buncrana and Fahan.

S. stellaris L.—I am under the impression I have seen this on Bulbein Mount. As it is tolerably frequent in Donegal, I have taken no note of it.

Chrysosplenium oppositifolium L.—Common. At 1850 feet on Slieve Snacht.

Hydrocotyle vulgaris L.

Sanicula europæa L.—Local, W. E. H. At 500 feet on Crockaughrim.

Eryngium maritimum L.—Dunree; Leenane; Dunaff; Culdaff; much scarcer on Lough Foyle side. Sparingly at Innishowen Head, W. E. H.

Apium graveolens L.—Culmore, W. E. H.

Helosciadium nodiflorum Koch.—Very local in Donegal, and very rare in Innishowen; formerly at Stroove, but now exterminated by "Relief Works," W. E. H.; in a small lake near Carrickabrahy Castle, Doagh Island; at Blanket Nook, Lough Swilly.

H. inundatum Koch.—Frequent, W. E. H. In a pond at Buncrana, and about Inch Road.

Ægopodium Podagraria L.—A common and troublesome garden weed.

Bunium flexuosum With.—Abundant, W. E. H.

Sium latifolium L.—Marsh at Culmore Point, near Derry, Dr. Moore, Ord. Surv. Rept. Recorded erroneously in 'Cyb. Hib.' to District 12.

[? *Œnanthe fistulosa* L.—Beside the Presbyterian Church at Malin, Dickie. Very rare in Donegal.]

Œ. Lachenalii Gmel.—Frequent in Malin Estuary, from Goorey to Malin. I believe this was the species observed by Dickie, since it grows at the locality indicated for *Œ. fistulosa*. He has not recorded the present species.

Œ. crocata L.—Frequent, W. E. H. Plentiful between Fahan and Bridge-end, and about Malin; at Blanket Nook.

[*Œ. Phellandrium* L.—This plant is very rare in the extreme north of Ireland, and the one locality ("between Milford and Glentidaly"), which I have recorded in North-West Donegal, belongs, I believe, to *Œ. crocata*. The plant here is in all respects similar to *Œ. crocata*, except that it has not got the tuberous roots, and, not being familiar with *Œ. Phellandrium*, I concluded it to be the latter species. I have seen *Œ. Phellandrium* recently in many parts of the South of Ireland, and would be inclined to alter the range

given in the 'Cybele Hibernica' to "frequent, except the extreme north," instead of "south," as it stands there.]

**Petroselinum sativum* L.—At Moville, Donegal, Mr. C. Moore. Greencastle, W. E. H.

(To be continued.)

PODOPHYLLUM A FORMOSAN GENUS.

By H. F. Hance, Ph.D., F.L.S., &c.

Although during the past twenty-two years the writer has been able to add no inconsiderable number of species to the Chinese flora, it is doubtful if it has often been his good fortune to record a more interesting discovery than that which forms the subject of the present brief note. Specimens were first sent by the writer's friend, Mr. T. Watters, H. M. Consul at Tam-sui, in the spring of 1881; but these were so imperfectly dried and packed that they arrived with the floral organs all detached, so that it was impossible to ascertain whether the flower was iso- or diplostemonous. A living specimen was shortly after forwarded, but although very carefully tended, and growing nicely, it has only just now (March, 1883) produced a solitary blossom, the others having aborted, no doubt from exposure to cold. At the same time a liberal supply of flowers, both expanded and in bud, preserved in alcohol, has been received, through Mr. Watters's thoughtful kindness, and thus ample materials have been in hand for a complete examination.

The genus *Podophyllum* has hitherto consisted of but two species; the North American *P. peltatum* Linn.! the May apple or Mandrake of the United States (where the fruit is eaten, and from the rhizome of which the purgative resin named *podophylline*, so much employed in hepatic derangements, is prepared), which has twice as many stamens as petals, and the Himalayan *P. Emodi* Wall.! recently detected in the Tangut country, province of Kan-su, by Przewalsky,* in which petals and stamens are equal in number, and both of these have solitary white flowers. In the very distinct plant under notice the much larger isostemonous flowers are of a dull red, arranged in a pendulous group of five or six, in the fork of the two stem-leaves; they are bractless, and exhale a strong odour of putrefying flesh. The sepals are not caducous, and the connective is conspicuously prolonged beyond the anther-cells; but the essential characters are in every respect those of the genus.

The occurrence of *Diphylleia* and *Caulophyllum* in Japan and Sachalin, and of *Jeffersonia* in Manchuria, would of course have prepared us for the present discovery. Although agreeing in its

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* For this interesting piece of information the writer is indebted to M. Bataline's valuable 'Aperçu des travaux russes sur la géographie des plantes, de 1875-80' (St. Petersb., 1881), a copy of which he owes to the courtesy of the author.

isostemonous flowers with *P. Emodi*, the new plant is otherwise as distinct from that species as from the American one. The leaves have a curiously subulate-toothed margin, and quite shallow lobes.

Podophyllum pleianthum, sp. nov.—Caule erecto glaberrimo pruinoso 9-pollicari, foliis sterilibus radicalibus solitariis caulinis binis crassiusculis glaberrimis supra læte viridibus lucidis subtus pallidioribus sublucidis centrice v. subcentrice peltatis orbiculatis palmatim 6–8 lobatis lobis late triangulatis acuminatis vix quintam diametri partem æquantibus nervis supra impressis subtus prominentibus margine creberrime subulato-denticulatis pedalibus petiolis pruinosis æquilongis, floribus inter folia apice caulis nascentibus ebracteatis plerumque quinis pendulis odorem putridum exhalantibus expansis diametro 3½ pollicaribus pedicellis bipollicaribus superne clavato-incrassatis fultis, sepalis adpressis ovato ellipticis acutiusculis pruinosis venosis 14–16 lin. longis 7–9 lin. latis (interioribus paulo latioribus) peracta fecundatione tantum deciduis, petalis oblongis acutis brevissime unguiculatis apicem versus undulato-denticulatis nervis anastomosantibus percursis sordide sanguineo-rubris 18-19 lin. longis, staminum 6 petalis plus duplo breviorum antheris adnatis valvula longitudinali utrinque dehiscentibus filamentis æquilongis connectivo ultra loculos in apiculum obtusum lineam longum producto, ovario oblongo stylo crassiusculo stigmateque peltato cristato coronato filamenta tantum æquante, ovulis indefinitis circ. 6-seriatis.

In bambuseto impeditissimo, ad septentrionem oppidi Tam-sui, ins. Formosæ, amico T. Watters, Aprili mense a. 1881 jam ineunte, ex inopinato obvenit. (Herb. propr. n. 21697.)

ON THE FLORA OF SOUTH BEDFORDSHIRE.

By James Saunders.

(Continued from p. 75).

Prunus spinosa L.

P. insititia L.—Local. Barton. Sharpenhoe.

P. Avium L.

P. Padus L.—Luton Hoo Park, probably planted.

Spiræa Ulmaria L.

S. Filipendula L.—Doubtless indigenous on the grassy slopes of the Chiltern Hills, where it grows with *Anemone Pulsatilla*, *Spiranthes autumnalis*, &c.

Agrimonia Eupatoria L.

Poterium Sanguisorba L.—Abundant on railway banks.

Alchemilla arvensis Scop. *A. vulgaris* L.

Potentilla Fragariastrum Ehrh. *P. Tormentilla* Scop.

P. reptans L. *P. Anserina* L.

(*P. argentea* L.—Occurs at East Hyde, just over the county border in the extreme south.)

Comarum palustre L.—Rare. Flitwick Marsh.

Fragaria vesca L.

Rubus Idæus L.—Local. Leagrave. Flitwick. Materials are being collected for a list of the segregates of the Rubi and Rosæ.

Geum urbanum L.

Cratægus monogyna Jacquin.

Pyrus Malus L.

Lythrum Salicaria L.

L. Hyssopifolia L.—Occurs as a weed at Putteridge Bury, just on the borders of the county.

Epilobium angustifolium L.—Railway banks. Woods near Whipsnade.

E. hirsutum L. *E. parviflorum* Schreb. *E. montanum* L. *E. palustre* L.

E. obscurum Schreb.—Banks of the Lea, Luton Hoo.

Circæa Lutetiana L.

Myriophyllum verticillatum L.—Local. A pond at Pepperstock.

M. spicatum L.—Local. Ponds, Limbury.

Hippuris vulgaris L.—Local. Luton Hoo Lake.

Callitriche verna L.

C. platycarpa Kutz.—Rare. Flitwick Marsh.

Bryonia dioica L.—Common.

Ribes rubrum L.—Woods near Studham, far from houses.

Sedum Fabaria Koch.—Woods near Market St. Aspley Woods. By the R. Lea, New Mill End.

S. album L., var. *teretifolium*.—Tiled roofs, Barton. *S. acre* L.

Sempervivum tectorum L.—Flitwick. Harlington.

Saxifraga tridactylites L.—Ampthill. Luton.

S. granulata L.—Limbury. "Marslets" near Luton.

Chrysosplenium oppositifolium L.—Rare. Bank of a rill near Toddington:—"Eversholt," Abbot.

Hydrocotyle vulgaris L.—Observed only on Flitwick Marsh, where it is abundant.

Sanicula europæa L. *Helosciadium nodiflorum* Koch.

Petroselinum segetum Koch.—Local. Barton Hills.

Ægopodium Podagraria L.

Carum Bulbocastanum Koch.—Limited to the chalk district, where it is abundant at Limbury, Biscot, and the Warden Hills. Swine are often fed on the tubers, which are said to produce a kind of intoxication the first day.

Bunium flexuosum With.

Pimpinella Saxifraga L.

P. magna L.—Local. Brammingham. Sundon. Totternhoe.

(*Sium latifolium* L.—Banks of the Ouse above Bedford. Not observed in S. Beds.)

S. angustifolium L.—Limbury. Luton Hoo Park.

Bupleurum rotundifolium L.—Rare. Barton Hills, in chalky fields.

(*Œnanthe fistulosa* L.—Local. Northall. Flitwick.

(*E. fluviatilis* Coleman.—R. Ouse, above Bedford. Not observed in S. Beds.)

Æthusa Cynapium L.

Fœniculum vulgare L.—An escape on railway banks.

Angelica sylvestris L.—Common.

Pastinaca sativa L.—Roadsides. Common.
Heracleum Sphondylium L.
Daucus Carota L.
Torilis infesta Spreng.—Local. Eversholt. Houghton.
T. Anthriscus Gaertn.
T. nodosa Gaertn.—Local. Markham Hills. Leagrave.
Chærophyllum Anthriscus L.—Local. Heath and Reach.
C. sylvestre L. *C. temulum* L.
Scandix Pecten-Veneris L.
Hedera Helix L.
Cornus sanguinea L.—Common.
Adoxa Moschatellina L.—Locally abundant. Limbury. Streatley.
Sambucus nigra L.
S. Ebulus L.—Rare. Limbury.
Viburnum Opulus L. *V. Lantana* L.
Lonicera Periclymenum L.
Galium Cruciata With.—Local. Hexton.
G. verum L. *G. Mollugo* L. *G. saxatile* L. *G. palustre* L. *G. Aparine* L.
G. uliginosum L.—Local. Bog Heath and Reach.
G. tricorne With.—Common over the chalk area.
Asperula odorata L.
Sherardia arvensis L.
Valeriana dioica L.—Not uncommon in moist meadows.
V. Mikanii Bab.—Not uncommon in the South. This is also Abbot's specimen of *V. officinalis* L. See Journ. Bot. 1881, p. 41.
V. sambucifolia Mikan.—Observed only at Flitwick.
Valerianella olitoria Moench.
V. dentata Koch.—Local. Chalky fields, Barton Hills.
Dipsacus sylvestris L.—Frequent.
Scabiosa Succisa L. *S. arvensis* L.
S. Columbaria L.—Abundant on the chalk hills.
Onopordium Acanthium L.—Not uncommon by roadsides and fields over the chalk area.
Silybum Marianum Gaertn.—Woods in Ampthill Park.
Carduus tenuiflorus Curt.—Local. Sandy soil, Flitwick.
C. nutans L.—Abundant on the true chalk.
C. crispus L. *C. lanceolatus* L. *C. palustris* L. *C. arvensis* Curt.
C. eriophorus L.—Local. Sundon.
C. acaulis L.—Abundant on the chalk hills. The caulescent form rare,—a hedgebank, Biscot.
Carlina vulgaris L.—Abundant on the chalk escarp.
Arctium majus Schkuhr.—Local. Limbury.
A. minus Schkuhr.—Local. New Mill End.
Serratula tinctoria L.—Very local, on the lower greensand range.
Centaurea nigra L. *C. Scabiosa* L. *C. Cyanus* L.
Chrysanthemum segetum L. *C. Leucanthemum* L.
Matricaria Parthenium L.—Local. Fields, Stopsley.
M. inodora L.
M. Chamomilla L.—Local. Leagrave. Barton Hills.
Tanacetum vulgare L.—Apparently limited to the greensand. Maulden. Ridgmount.

Anthemis arvensis L.—Local. On sandy soil, Flitwick.
A. Cotula L.—Abundant in cornfields.
Achillea Millefolium L. *Artemisia vulgaris* L.
Filago germanica L.
F. apiculata G. E. Sm.—Rare. Flitwick.
F. minima Fries.—Local. On sandy soil. Flitwick. Aspley.
Gnaphalium uliginosum L.
Senecio vulgaris L. *S. Jacobæa* L. *S. aquaticus* Huds.
S. sylvaticus L.—Locally abundant. Flitwick.
S. campestris DC.—Limited to the lower chalk escarpment. Abundant on the Barton Hills.
Bidens cernua L. *B. tripartita* L.—Both rather local.
Inula Conyza DC.—Local. Dallow Lane, Barton.
I. dysenterica L.
Erigeron acris L.—Local. Leagrave. Barton.
Solidago Virga-aurea L.—Rare. Clophill Woods.
Tussilago Farfara L. *Petasites vulgaris* Desv.
Eupatorium cannabinum L.
Cichorium Intybus L.—Common by waysides.
Lapsana communis L. *Hypochæris glabra* L.
Leontodon hispidus L. *L. autumnalis* L.
Picris hieracioides L.—Local. Barton. Pepperstock.
Tragopogon pratensis L. *Taraxacum Dens-leonis* Desv.
Lactuca muralis Fresen.—Rare. Luton Hoo Park Walls.
Sonchus oleraceus L. *S. asper* Hoffm. *S. arvensis* L.
Crepis virens L.
Hieracium Pilosella L.
H. umbellatum L.—Local. Chiltern Green.
H. boreale Fries.—Woods, Clophill. Aspley.
Jasione montana L.—Limited to the lower greensand.
Campanula glomerata L.—Common on the chalk hills.
C. Trachelium L.—Local. Woods:—Streatley. Barton.
C. latifolia L.—Rare. Woodside, Barton Leete.
C. rapunculoides L.—Rare. Between Barton and Hexton. Mrs. Carruthers.
C. rotundifolia L.
C. patula L.—Rare. Luton Hoo. Mr. J. Edge.

(To be continued.)

NOTES ON VEGETABLE PRODUCTS OF THE SAHARANPUR & DEHRA DUN DISTRICTS, N.W. INDIA.

By J. F. Duthie, M.A., F.L.S.

In the course of getting together, for the Amsterdam Exhibition, a collection of agricultural specimens from the neighbourhood of Saháranpur, I have had opportunities of obtaining some information which I venture to think may be usefully recorded in the form of short notes.

The climate of Saháranpur is essentially that of the plains of

Northern India, though somewhat tempered by reason of its proximity to the Himalayas. The Siwalik range of hills divides the district of Saháranpur from that of Dehra Dún, where the climate is some degrees cooler and the vegetation correspondingly different.

Cereals.

Cold Season. Wheat, *Triticum sativum* Lam. (vern. Gehur.)
,, Barley, *Hordeum vulgare* L. (vern. Jau.)
,, Oats, *Avena sativa* L. (vern. Jai.)
Rainy Season. Rice, *Oryza sativa* L. (vern. Dhár.)
,, Maize, *Zea Mays* L. (vern. Makai.)
,, Great Millet, *Sorghum vulgare* Pers. (vern. Joar.)
,, Bulrush or Spiked Millet, *Pennisetum typhoideum* Rich. (Bájra).
,, Italian Millet, *Setaria italica* Kunth. (Kangni.)
,, *Paspalum scrobiculatum* L. (vern. Kodon.)
,, *Panicum miliaceum* L. (vern. Chena.)
,, ,, *frumentaceum*, Roxb. (vern. Sawán.)
,, *Eleusine corocana* Gærtn. (vern. Mandua.)

Wheat is the most important winter crop of Upper India. There are several distinct varieties, including the bearded and the beardless; different names are also given according to the nature of the grain as to its colour, size, and consistency. This crop is very frequently sown mixed with barley, also with certain kinds of mustard and rape (*Brassica campestris*, vars., and *B. juncea*), the oil from which is largely used by the natives for various purposes. With wheat are also grown *Lathyrus sativus* (Kisari), *Cicer arietinum* (Gram or Chána), and *Ervum Lens* (Masúr), three kinds of pulse which will be alluded to further on; also, but less frequently, *Linum usitatissimum* (Linseed), and another oil-plant called "Duan" (*Eruca sativa*).

Barley is another cold-weather crop, and of this there are two well-marked varieties, *viz.*, the 2-rowed and the 6-rowed (*Hordeum distichon* and *H. hexastichon*), the latter being the one most commonly cultivated in India. Like wheat, it is usually sown mixed with the mustards and other plants not mentioned. A black-grained barley was exhibited at the Saháranpur Agricultural Show last year.

Oats are extensively cultivated in the stud farm at Saháranpur for the use of the depôt horses. On the hills it is grown mixed with barley, and both grains are ground up and eaten together.

Rice is by far the most important crop of the kharif or rainy season. The varieties are most numerous, and some of them very distinct in appearance. The finer kinds are usually transplanted from seed-beds, whilst the inferior sorts are sown broadcast. It is largely grown in the Himalayan Valleys and wherever the ground can be irrigated.

Maize or Indian Corn.—Compared with the other crops this is a recent introduction. It thrives well both in the plains and on the Himalayas. It is a rapid grower, capable of coming to maturity within six weeks from sowing, should the season be favourable.

The young stalks are a favourite fodder for cattle. The varieties are mainly distinguished by the colour of the cob, varying from pale yellow or white to a deep claret-red. The cobs roasted whilst green are much eaten both by Europeans and natives. A common bazaar sweetmeat is made of the popped grains roasted with sugar. A variety called "cuzco maize" was introduced from America a few years ago, and has succeeded fairly well, at the Government Garden at Chajuri, on the Himalayas.

Great Millet or Guar (*Sorghum vulgare*). — This is largely cultivated during the rainy season. It is usually sown mixed with "Til" (*Sesamum indicum*), and Arhar (*Cajanus indicus*), and other pulses, such as Lobiya (*Vigna Catiang*), Mung (*Phaseolus Mungo*), Urd (*P. Mungo*, var. *radiatus*), so as to ensure some sort of return in case the guár should fail. There are two varieties, one having reddish grains, and the white. This plant is much valued as a cattle fodder, and is often cultivated exclusively for this purpose, under the name of Chari. Mr. Wright, in his Memo. on the Agriculture of the Cawnpore District, gives an interesting description of some native observances during the harvesting of this crop: —"The guár was heaped by the cultivator in the shape of the figure 8, one end towards the Ganges, and a sickle and a branch of Madár (*Calotropis gigantea*), in honour of Shaikh Madár (a local saint), stuck up in it. All round the heap a line of cow-dung was traced, and the smoke of a sacrificial fire made to blow upon the heap to keep off evil spirits (jins). A double handful of grain was given in honour of Shaikh Madár, one to the village minstrel (bhát), one to the Brahmin, one to the family priest (parohit), and half a seer each to the village carpenter, blacksmith, barber, and water-carrier." An allied recently introduced species called *S. bicolor* is cultivated on the Saháranpur stud lands under the name of *imphi* or *black sorghum*; the stems are full of saccharine matter.

Spiked Millet or Bajra (*Pennisetum typhoideum*).—Better known perhaps under the name of *Penicillaria spicata*: it forms a very handsome crop during the rains. It is inferior though to juár, both as to its grain and for fodder purposes. Bájra is sown mixed with the seeds of the same plants which accompany juár.

Italian Millet or Kangni (*Setaria italica*), is another rainy season crop, though preferring a light elevated soil. It is very rarely sown by itself, being usually mixed with Sawán (*Panicum frumentaceum*), or with Chena (*P. miliaceum*). The flour is thought very highly of by the Brahmins, who use it for porridge and cakes; it is also considered next to wheat the best for making pastry.

Kodon (*Paspalum scrobiculatum*).—This is very little cultivated about Saháranpur, and used only by the poorer people. In other districts, however, it is largely grown on account of its being easily cultivated on poor unmanured land.

Chena (*Panicum miliaceum*).—This is usually sown as a hot-weather crop, and, as it requires constant irrigation, it is generally to be seen growing in the vicinity of wells or canal channels. As the plant ripens the panicles become gracefully bent, owing to the

weight of the seed. It is cultivated on the Himalayas up to 6000 feet.

Sawan (*Panicum frumentaceum*).—This and the last-named Millet are very quick-growing kinds, coming to maturity within six weeks from sowing. It is grown extensively on the Himalayas, as well as on the plains. In rich damp ground the stems are apt to topple over, and, rooting at the nodes, throw up strong secondary shoots. The hill name is Jhangora. An allied species, *P. colonum*, is a common wild plant during the rainy season, and is called Jangli Jhangora or Jangli Sawán by the natives, who sometimes collect and use the seeds.

Mandua (*Eleusine corocana*).—This is very extensively grown both on the plains and Himalayas. In Dehra Dún and the neighbouring hilly districts it forms the staple food of the inhabitants. On the hills it is usually mixed with certain coarse pulses, *e. g.*, *Dolichos biflorus* (Kulat or Kulthi), *Glycine Soja* (Bhat, Soy Bean, or Japan Pea), and *Phaseolus Mungo*, var. *radiatus* (Urd). It prefers a light soil. Another species of *Eleusine* (*E. ægyptiaca*) is a common grass in the jungles, and the seed is collected for food by the poorer classes.

(To be continued.)

SHORT NOTES.

Saxifraga pedatifida Sm. as a British Plant.—The evidence adduced by Mr. A. W. Bennett at p. 152 does not, I am afraid, place the claim of *Saxifraga pedatifida* to be considered as belonging to the British Flora upon any stronger or more satisfactory footing than that upon which it has hitherto rested. Irish botanists have of late years regarded the distributed plants of Andrews (especially Saxifrages) as open to very grave question with reference to the localities from which they were reputed to be derived; for it is no secret that many of these plants were taken from specimens cultivated in Mr. Andrews' garden, and that hence accidental mistakes in their issue not unfrequently arose. It is more than probable that the specimens referred to by Mr. Bennett belong to this category, since no other botanist has ever found the plant on Achill, notwithstanding the fact that the island has been frequently searched. In any case until further *direct* confirmation of its occurrence there is obtained they cannot be regarded as settling the point, any more than Dr. J. T. Mackay's specimen of *Alchemilla alpina*, preserved in the Herbarium of Trinity College, Dublin, can be held to settle the occurrence of the latter species in District 9 of the 'Cybele Hibernica,' where we are now certain that it does not occur.—Thos. H. Corry.

Monœcious and hermaphrodite Mercurialis perennis.—When gathering some fine fruiting specimens of this plant, during the second week in May, last, one of them was observed with both

staminate and pistillate flowers in the same inflorescence. Upon subsequent examination it was found to contain not only diclinous flowers, but hermaphrodite ones also. Of these, some conformed to the normal type of the pistillate flowers, but developing perfect stamens in place of staminodia. One of the others had four perfect stamens, which were growing one on each side of the usual staminodia; and another had three perfect stamens, arranged two on one side of the septum and one on the other. Several of the pistillate, and one of the hermaphrodite flowers, contained trimerous fruits, but in no case was the additional cell fully developed. The three stigmas of these fruits presented no difference that could be detected with an ordinary lens. All the staminate flowers contained fewer than the normal number of stamens, most of them seven. A clearer idea may possibly be given by the following summary of the fully developed flowers, besides which there were several unexpanded staminate buds. The total number of spikes on the plant was five. The staminodia are represented by 0.

	No. of flowers.	Sepals.	Andrœcium.	Gynæcium.
Staminate.....	4	3	7 (?3+3+1)	—
Pistillate, normal	7	3	0+0	(2)
,, abnormal	3	3	0+0	(3)
Hermaphrodite...	2	3	1+1	(2)
,, ...	1	3	2+1	(3)
,, ...	1	3	{1+0+1 / 1+0+1}	(2)

Besides the specimen just described several hundred spikes were examined, from the same hedgebank, and only one other abnormal plant was detected. This had three spikes, on which were numerous (about 15) staminate flowers, and three pistillate ones, but all of them were of the normal types. The occurrence in the first mentioned example, of both hermaphrodite flowers and trimerous fruits, would suggest a reversion to an ancestral form characterized by perfect flowers and trimerous symmetry. The abnormal fruits also indicate a close affinity with the tri-carpellary gynæcium of both *Buxus* and *Euphorbia*.—James Saunders.

Japanese Gentians.—In examining the Gentians collected by Mr. J. Bisset in Japan, I find that some confusion has arisen about two of the Japanese species of the *Chondrophylla* section. A specimen of Thunberg's in the British Museum Herbarium, named by Solander "*Gentiana aquatica* Thunb. an Linn.?" agrees with the description of Grisebach's *G. Thunbergii*, and is the same as Maximowicz's *G. japonica*, a specimen of which he has sent to the British Museum. The drawing in Sô Mokou Zoussetz, vol. iv., under the native name *Harurindô*, is there rightly identified as *G. Thunbergii* Griseb., and thus noticed in Franchet & Savatier's 'Enumeratio plantarum in Jap.,' vol. i., p. 323, though unfortunately in vol. ii., p. 450, it has been referred to *G. japonica* Maxim., as if the two species were distinct. Zollinger's specimen (no. 331), distributed as *G. Thunbergii* Griseb., is not the plant of Thunberg and Grisebach, but agrees with what Maximowicz in

'Mél. Biol.' ix. 397, calls *G. Thunbergii* as distinct from his *G. japonica*. Perhaps it would be convenient to name it *G. Zollingerii*. It does not appear to be as common as the true *G. Thunbergii*. The species then will stand thus :—

G. Thunbergii Griseb. DC. Prod. ix. p. 108.
= *G. aquatica* Thunb. (non Linn.), "Har Rindo," Fl. Jap. p. 115.
= *G. japonica* Maxim., Mél. Biol. ix. p. 396.
= *Harurindô* of SôMokou Zoussetz, iv.

G. Zollingerii = *G. Thunbergii* Zollinger (non Griseb.) No. 331., in System. Verzeich. in ind. Archip., 3 Heft p. 49.
= *G. Thunbergii* Maxim. (non Griseb.) Mél. Biol. ix. p. 397.

W. Fawcett.

NOTICES OF BOOKS.

On Cephalozia (a genus of Hepaticæ), its Subgenera, and some allied Genera. By Richard Spruce. Malton : Slater, 1882, pp. vi. 96.

Under the above title has appeared a short memoir by our most distinguished hepaticologist, in which are given some of the results of his profound study of the group.

In the preface the author proposes to employ, as aids to classification, certain characters, the value of which had not previously been adequately appreciated, and adds remarks on nomenclature and synonymy.

The memoir itself contains full descriptions of all known European species belonging to or nearly allied to *Cephalozia*, with short diagnoses of other species known to the author, especially South American, the latter of which will be more fully described in his forthcoming work on the 'Hepaticæ of the Amazon and Andes,'—a work awaited with anxious curiosity by students, and one which will probably rank amongst the most important contributions to the literature of hepaticology. Up to the present time great importance has been attached to certain characters in the division of the *Jungermaniaceæ* into tribes, genera and species, such as—1st. The frondose, or those with frond-like stems, as contrasted with the foliose, or those having distinctly leafy stems, which has constituted for a long time the primary division in most systematic arrangements. 2nd. The insertion of the leaves on the stem, either succubous, having the apex of each leaf lying under the base of the next; or incubous, having the apex of each leaf overlying the base of the next. 3rd. The fructification being either terminal on the stem (acrogenous) or lateral on short branches (cladogenous), how insufficient of themselves these characters are to separate tribes and genera is illustrated by the fact that they are all found in the different species of the single genus *Cephalozia*.

In place of these the author points out the existence of other characters upon which a more natural division of these plants might be based, characters which have either been esteemed of little value or have not previously been noticed at all, but which have been proved, by careful and extensive study, "to be constant throughout large groups of species, and therefore of great diagnostic value."

These are—1st, The insertion of the branches on the stem, either all postical or all lateral, or some combination of these modes, but very rarely antical; 2nd, The origin of the primary keels or angles of the perianth; 3rd, The structure of the capsule-walls, and the number of the cell-layers composing them; 4th, The number of the sexual, and especially of the male, organs.

The genera *Cephalozia* and *Kantia* are examples of those genera having a postical insertion of branches; and *Lejeunia*, *Radula*, and *Frullania*, of those having only lateral branches.

In the author's notes on the perianth are some original and valuable observations on its origin and structure. He finds that two types of perianth obtain throughout the leafy *Jungermaniaceæ*; the one (*Epigonanthæ*) is distinguished by having the keels, or angles, of the perianth at the actual sutures of the connate flower-leaves. These angles are normally three, and the third angle is always *in front*. This form of perianth is accompanied by a laterally compressed stem and involucre, such as we see in *Lophocolea*, *Chiloscyphus*, &c. In the other type (*Hypogonianthæ*) the angles of the perianth are the medial folds of the complicate flower-leaves, and not their marginal sutures; and these leaves being three, two lateral and the third postical, their union produces a trigonous perianth, with the third angle *at the back*, as in *Cephalozia*, *Lepidozia*, *Bazzania*, &c.; and although additional (or supplementary) angles may be developed in the perianth of certain genera and species, it is rarely difficult to refer the perianth with certainty to one or the other of these two normal types.

Of the 3rd character, the structure of the capsule-walls and the number of the cell-layers, little is said by the author, the chief distinctions being the presence or absence on the innermost layer of semiannular fibres, and the number of cell-layers in the capsule of each genus or species. 4th. The number of the sexual organs, especially of the male (which character, although noticed by some writers, has not been sufficiently attended to), is found to be very constant in many genera.

The author does not, however, propose the two divisions, *Epigonianthæ* and *Hypogonianthæ*, as primary ones, but we may venture to conjecture that when he writes more fully upon the larger subject of the natural arrangement of the *Jungermaniaceæ* they will occupy an important place.

A history of the genus *Cephalozia* Dum. is given, followed by a summary of its main characters, with a division of it into eight subgenera, and a sketch of the relations which each subgenus has to the others, together with notes on conterminous species, which oblige us to unite the subgenera into a single comprehensive genus.

Although there are some startling combinations, as for instance of the frondose-like *Pteropsiella* and *Zoopsis* on the one hand, with the genus *Odontoschisma* Dum. (which is reduced to a subgenus), on the other, the consummate manner in which the author treats the subject shows us that we have an honest endeavour to arrive at a natural arrangement of these minute and complex plants.

The eight subgenera are:—1. *Proto-Cephalozia* S., which con-

tains one of the most curious forms that have been found amongst the hepatics, viz. *Cephalozia ephemeroides* S., found by the author in Venezuela, growing on moist earth in shade, and on little mounds thrown up by mud-worms, and appearing to the eye only a greenish confervoid film, like the protonema of a true moss. It is one of the simplest forms yet discovered, having, properly speaking, neither stem nor leaves, but from the base of the prothallium arises a female flower, and at the end of the thread-like branches of the prothallium are male spikes. 2. *Pteropsiella* S., a subgenus represented by a single species, *P. frondiformis* S., found by the author in South America. This species is one which illustrates the difficulty of relying upon the divisions "frondose and foliose," for although it is entirely destitute of stem-leaves, and in its general aspect resembles species belonging to the very remotely-allied genera *Blyttia* and *Metzgeria*, having, like them, a stem bordered by a broad green wing of from four to eight rows of cells on each side; yet it has the cladogenous male and female flowers, with the perianth and capsule exactly of a *Cephalozia*. 3. *Zoopsis*, a genus founded by Hooker to include the *J. argentea* of Taylor, a species which has occupied the especial attention of several hepaticologists,—Hooker, Mitten, Lindberg, and Leitgeb. The plants embraced in this genus have a flat ribbon-like appearance, with a crenate margin, and hence were looked upon by Taylor and others as being frondose; upon closer study these supposed crenate margins were found to be minute but true leaves, and the author has observed that the two original species, *Z. argentea* Tayl. and *Z. setulosa* Leitg., have really bilobed leaves, a fact overlooked by all previous writers. 4. *Alobiella* S. is represented by four species, all found in South America by the author; one of them also in the Antilles by Mons. T. Husnot, and named by Gottsche in his honour. It had, however, been previously collected by the author, and named in his MSS. *E. lancifolia*, but not being published the well-merited complimentary name of Gottsche must stand. In this subgenus the leaves are normally entire, rarely cloven at the apex, nearly flat, of an oblong or lanceolate shape, with large pellucid elongate cells. 5. *Eu-Cephalozia* S. is a subgenus typified by our common *J. bicuspidata*, and comprising the great bulk of the *Cephaloziæ* of the north temperate zone. 6. *Lembidium*, a subgenus, founded by Mitten as a genus, includes a species (*C. Boschiana* Lac.) which approaches in habit to *Odontoschisma denudatum*, and has the trigonous perianth and monandrous male bracts of *Odontoschisma* and *Eu-Cephalozia*. 7. *Odontoschisma* Dum.: in this subgenus are included our two British species *O. Sphagni* and *O. denudatum*, and one (*O. C. obcordata* S.) collected by the author in South America. 8. *Cephaloziella* S. is distinguished from the other groups by the slender stems, with the cortical layer similar to the inner layers; the absence of flagella; the minute leaves, with very small cells; the perianth, usually 4, 5 or 6 angled. It contains most of the smaller species of *Cephalozia*, of which we may cite the common *J. divaricata* as an example.

Especially interesting to the British hepaticologist is the

description given of several species new to our flora, and the exhaustive notes on those hitherto little known or misunderstood. Amongst those published for the first time are *Cephalozia heterostipa* Carr. et Spruce, found on Ingleborough by Dr. Carrington, and on the Glyders, North Wales, by E. M. Holmes. *Cephalozia Jackii* Limpr., which is fully described, but not recorded for Britain, has recently been discriminated by the author amongst specimens collected by the late Wm. Wilson near Warrington. *Cephalozia leucantha* S., collected by J. Sim, Potarch, near Banchory, Scotland. *Cephalozia æraria* Pears., found by W. H. Pearson at the mouth of an old copper mine near Tyn-y-groes, North Wales.

Amongst those of our British species, which have hitherto been only announced as British, but not described, are *Cephalozia fluitans* (Nees), *C. multiflora* S., *C. Lammersiana* (Hüben), *C. elachista* (Jack); and in the appendix is given a description of *Anthelia Juratzkana* Limpr., which was found lately by W. West in Scotland, and announced in our journal at the time as new to Britain.

In the appendix is given a description of the following genera nearly allied to *Cephalozia*: *Hygrobiella* S., *Pleuroclada* S., *Arachniopsis* S., *Mytilopsis* S., *Anthelia* Dum., and *Blepharostoma* Dum., the first four being genera published for the first time. To the first is relegated *J. laxifolia* (Hook), which had previously been placed by Lindberg amongst the *Cephaloziæ*, but which differs from them by its laterally inserted branches, by being almost or quite destitute of radicles, and by the female flowers being constantly terminal, with a very lax but trifarious involucre. Two other species of recent discovery were added to the genus by the author, *J. myriocarpa* Carr., and *J. nevicensis* Carr.; but in our annotated copy he has adopted a new subgenus, proposed by Prof. Lindberg (*Eremonotis*), for *J. myriocarpa*, a species differing from *J. laxifolia*, in the absence of stipules, the cell-structures, and the bifarious involucre. Another species, about which much doubt exists, is added to this genus: *J. nevicensis* Carr., found in a damp situation on Ben Nevis by Mr. John Whitehead, of which no trace of flowers of either sex has been found. Herr Limpricht, in his "Neues Arten und Formen der Gattung Sarcoscyphus," seems inclined to look upon it as a *Sarcoscyphus*. The genus *Pleuroclada* is proposed to contain *J. albescens* Hook, which had been assigned by Dumortier and others to *Cephalozia*, but from which it is distinguished by its lateral and subpinnate ramification, bluish white colour, very fleshy perianth, and other characters.

The genus *Arachniopsis* S., so-named on account of the different species comprised in it forming broad thin films, like spider's webs, contains some most beautiful forms. Three species only are known, all found by the author in South America. The new genus *Mytilopsis* S., "having leaves so equally and closely complicate, that they resemble in miniature a slightly-gaping bivalve shell, such as that of the mussel;" hence the name approaches nearer to the genus *Micropterygium*, but is distinguished from it by its very flat and frond-like stem, with branches springing from the under side, as in *Cephalozia*. This fine genus is represented by only one known species, *Mytilopsis albifrons* S.

In closing his memoir the author reviews the tribes founded by Dumortier, and from examples given justifies his opinion that, with such eccentric combination of genera, their adoption becomes impossible. The systems of Nees and of Lindberg are also subjected to criticism, followed by remarks on the development of certain forms, and concluding with a masterly attempt to indicate the affinities, or more properly speaking the homologies, of the pouch-fruiting *Jungermaniaceæ*.

We understand that only 200 copies of this memoir have been printed, so that very soon we may expect it to become, by reason of its excellence, a rare and much sought-after publication.

Gaelic Names of Plants, Scottish and Irish, . . . with notes on their etymology . . . By JOHN CAMERON. Blackwood & Sons, Edinburgh & London, 1883, 8vo, pp. ix. 130.

THIS very interesting little volume presents in a collected form a series of papers which have appeared in the 'Scottish Naturalist' —a journal we regret to learn has ceased to exist. Mr. Cameron tells us that "nearly ten years have been occupied in searching through vocabularies, reading Irish and Scottish Gaelic, and generally trying to bring into order the confusion to which these names have been reduced, partly by the carelessness of the compilers of Dictionaries, and frequently by their botanical ignorance. To accomplish this, numerous journeys had to be undertaken among the Gaelic-speaking populations, in order, if possible, to settle disputed names, to fix the plant to which the name was applied, and to collect others previously unrecorded." Only those who have been engaged in similar work know how much is implied in these remarks, and we can sympathize with our author when he says that "if the difficulties of its accomplishment had been foreseen, he would have hesitated to make the attempt." No collection of Gaelic names with English translations has, so far as we know, been hitherto published; and Mr. Cameron has been fortunate in securing the co-operation of the Very Rev. Canon Bourke, of Claremorris, a well-known Gaelic scholar.

It is to be regretted that Mr. Cameron did not include in his list the collections of Gaelic names published in Threlkeld's 'Synopsis Stirpium Hibernicarum' (1728), and K'Eogh's 'Botanologia Universalis Hibernica' (1735). Many of these are of course taken up in M'Donald's vocabulary published in 1741, and so are included by Mr. Cameron; but a comparison of Threlkeld's 'Index of the Galeagh or Irish names' with Mr. Cameron's list of Gaelic names shows that many of the former are omitted from the latter. We should have been glad had Mr. Cameron indicated clearly which of the names are in actual use and which from printed sources; some of them seem to us to be derived from vocabularies, —for example, we should hardly expect to find a genuine Gaelic name for such plants as *Amaranthus caudatus*, or *Cichorium Endivia*; *Lus aphione* looks like a book-name for *Paonia*,—and indeed several of the Gaelic names seem to be rather translations than independent

synonyms. Among omitted names may be mentioned that for *Euphorbia hyberna*, given by Mr. Hart in this Journal for 1873 (p. 339) as 'makkin-bwee'—a name of some interest as being one of the few Irish names that has found its way (spelt 'makinboy') into English books. We suspect that Mary's Candle would be the correct translation of *Cuineal Mhuire*, a Gaelic name for *Verbascum Thapsus* which Mr. Cameron derives from '*cuing*, asthma, or shortness of breath.' Some of the parallels to English names are very interesting—and to the student of plant names the book is indispensable. We regret that this notice, already too long delayed in consequence of the demands upon our space, is for the same reason necessarily a brief one.

Under the title 'A Handbook of Higham: or, the Curiosities of a Country Parish,' (Wildish, Rochester), the Rev. C. H. Fielding has published a handy little volume, undertaken with the laudable motive of creating an interest in the Natural History and Antiquities of the Rochester district, in which Higham is situated. The list of plants, with which alone we are concerned, contains 426 species of Phanerogams, with four ferns and four Equiseta. It is at once obvious that the number might be easily extended; only three Carices are enumerated, while there is no attempt at critical work among the Roses or Rubi; and it is hardly likely that there are no forms of *Batrachium* except *circinatus* and *fluitans*. There is a pleasant introductory chapter to this part of the work, at the close of which Mr. Fielding asks for additional information, to be included in a second edition.

We have received 'French Forest Ordinance of 1869, with historical sketch of previous treatment of forests in France' (Edinburgh: Oliver & Boyd), compiled and translated by Dr. J. Croumbie Brown, and intended as a companion to his 'Forests of England,' which we mentioned last month.

Mr. English, of Epping, who has prepared specimens of the larger fungi for various museums, and has succeeded in retaining their form and colour, has issued a little 'Manual for the preservation of the larger Fungi in their natural condition' (Epping: Davis), which contains useful hints upon the subject.

A supplement to Chapman's 'Flora of the Southern States' has been issued, containing 15 species new to science, and a large number not previously recorded from the region with which the book deals, no fewer than 200 of such additions being from Florida.

The fourth volume of the 'Monographiæ Phanerogamarum' has just been published. The orders monographed are *Burseraceæ* and *Anacardiaceæ*, by Dr. Engler, and *Pontederiaceæ* by Count Solms-Laubach. In *Anacardiaceæ* two new genera are established:—*Pleiogynium* (on *Spondias acida* Soland.), and *Pseudospondias* (on *Spondias microcarpa* Rich.). Three plates are devoted to dissections of the genera of *Burseraceæ*, the remaining twelve illustrating the *Anacardiaceæ*.

The recently issued part (vol. viii., fasc. 1) of the 'Acta Horti

Petropolitani' is mainly occupied by an important paper by Dr. Trautvetter, entitled 'Incrementa Floræ Phænogamæ Rossicæ,' the enumeration being carried down to the end of *Leguminosæ*. Dr. Regel describes a new genus of *Umbelliferæ*, which he names *Renardia*, founded on a plant collected in Turkestan by Fetison.

The recently issued part of Dr. Beccari's 'Malesia' contains a description of a new genus of *Olacineæ* (*Petalinia* Becc.) from Bauca; and a paper by Dr. Engler on the 'Aracee della Malesia e della Papuasia raccolte da O. Beccari,' illustrated with thirteen excellent plates.

New Books. — J. P. J. Koltz, 'Prodrome de la Flore de Luxembourg,' part ii. (Plantes vasculaires—Muscinées) (Luxembourg: Schamburger). — F. von Mueller, 'Systematic Census of Australian Plants: pt. i. Vasculares' (Melbourne). — E. Bonnet, 'Petite Flore Parisienne' (Paris: Savy). — W. Detmer, 'Lehrbuch der Pflanzenphysiologie' (Breslau: Trewendt). — R. H. Beddome, 'Indian Ferns' (London: W. Thacker & Co.). — C. & W. Barbey, 'Herborisations au Levant: Egypt, Syrie et Mèditerranée' (Lausanne: Bridel). — E. F. Dresler, 'Flora von Löwenberg i. Schl.' (Holtsch, Löwenberg). — F. Siebenmann, 'Die Fadenpilze Aspergillus flavus niger u. fumigatus; Eurotium repens (U. Aspergillus glaucus)' (Wisbaden, Bergmann). — J. Herz, 'Synopsis der Pharmaceutischen Botanik' (Ellwangen, Huss.) — A. Meyer, 'Das Chlorophyllkorn' (Leipzig, Felix).

Articles in Journals.

American Journal of Science. — A. Gray & J. H. Trumbull, 'Review of DeCandolle's "Origin of Cultivated Plants."'

American Naturalist. — J. L. Zabriskie, 'Dispersion of seed by *Wistaria*.'

Ann. Sciences Nat. (Bot., 6th Sér., t. xv., no. 4; April). — B. Renault, 'Considerations sur les rapports des Lépidendrons, des Sigillaires, et des *Stigmaria*' (concluded; 1 plate). — G. Capus, 'Indications sur le climat et la végétation du Turkestan.' — A. Franchet, 'Plantes du Turkestan' (*Ranunculus rufosepalus*, *R. turkestanicus*, *Nigella diversifolia*, *Pachypterygium stelligerum*, *Hymenophysa macrocarpa*, *Isatis hirtocalix*, *Saponaria corrugata*, *Gypsophila intricata*, *Silene Tachtensis*, *Acer pubescens*, *Haplophyllum pilosum*, *Chesneya turkestanica*, *Astragalus Kohistanus*, *A. ourmitanensis*, *A. timuranus*, spp. nn.; 4 plates).

Ann. & Mag. Nat. Hist. — R. Kidston, 'Affinities of *Pothocites*' (4 plates).

Botanical Gazette. — A. Gray, Biography of John Eatton Le Conte (1784–1860). — J. C. Arthur, *Camptosorus rhizophyllus*, var. *intermedius* (1 plate).

Botanische Zeitung (Ap. 27). — A. Fischer, 'Ueber die Zelltheilung der Closterien' (concluded). — (Ap. 27; May 4, 11, 18). H. Hoffmann, 'Culturversuche über Variation.'

Botaniska Notiser.—L. M. Neuman, 'Studier öfver Skånes och Hallands flora.'

Botanisches Centralblatt (nos. 18, 19, 20). — L. Celakovsky, 'Ueber einige Arten der Gattung *Teucrium*.'—(No. 21). J. Jaggi, '*Scirpus Scheuchzeri* Brügger.'

Bull. Soc. Bot. France (xxx., pt. 1; April). — A. Chabert, 'Recherches botaniques dans les Alpes de la Maurienne.' — E. Prillieux, 'Etudes sur le *Peronospora* de la Vigne.' — A. Viand-Grand-Marais & Guyon-Varch, 'Plantes Vasculaires de l'isle de Croix, Morbihan.'—M. Cornu, 'Recherches sur les Péronosporées.' —E. Mer, 'De l'influence de l'ombre et de la lumière sur la structure, l'orientation, et la végétation des aiguilles d'*Abies excelsa*.' — H. Loret, 'Notice sur l'herbier et la "Flore des Pyrénées" de Philippe.' — H. Vilmorin, 'Expériences de croisement entre des blés differents' (1 plate).

Bulletin of Torrey Bot. Club (April).—J. Schrenk, 'Notes on the Haustoria of some North American parasitic Phanerogams' (*Comandra umbellata;* 3 plates). — E. L. Greene, 'New Plants' (*Œnothera Hilgardi, Corethrogyne detonsa, Encelia stenophylla, Hemizonia Kelloyii, Artemisia franserioides*). — G. Vasey, *Stipa stricta, Aristida Parishii*, spp. nn.—E. Tuckerman, *Ramalina crinita*, sp. n.

Flora (Ap. 21). — F. Pax, 'Flora des Rehborns bei Schatzlar.' — P. F. Reinsch, 'Weitere Beobachtungen über die eigenthümlichen einzelligen Körper in der Carbonkohle.' — (May 1). 'Sitzungsbericht des botan. Vereines in München' (*Rhizomorpha necatrix*, sp. n.).—P. G. Strobl, 'Flora der Nebroden' (contd.).

Garden (May 12). — R. I. Lynch, *Dietes Huttoni* (with fig.).— E. M. Holmes, 'Japanese Peppermint.'

Gardeners' Chronicle (Ap. 26).—W. B. Hemsley, 'The Common Fig-tree.' — *Masdevallia Schlimii* Lind. (fig. 80); *M. Chestertoni* Rchb. f., sp. n.—(May 3). *Oncidium Hrubyanum* Rchb. f., *Trichocentrum orthoplectron* Rchb. f., spp. nn.; *Odontoglossum chætostroma*, n. hyb. nat. (?).—*Fritillaria pallidiflora* (fig. 91). — List of Garden Orchids (*Cœlogyne*, contd.). — (May 12). A Hybrid Saxifrage (*S. purpurascens* × *S. cordifolia*; fig. 97). — N. E. Brown, *Primula altaica*.—List of Garden Orchids (*Otochilus, Pholidota*). — (May 19). *Dendrobium Harveyanum* Rchb. f., n. sp. — *Greyia Sutherlandi* (fig. 100). — J. G. Baker, 'The species of *Tulipa*.' — G. Engelmann, *Opuntia subulata*.—List of Garden Orchids (*Calanthe, Arundina*).— (May 26). N. E. Brown, *Cestrum Hartwegii*, var. *pubescens*, n. var. —H. G. Reichenbach, *Dendrobium Antelope*, sp. n.—W. B. Hemsley, 'The Bermuda Cedar' (2 figs. of *Juniperus Bermudiana*). — List of Garden Orchids (*Elleanthus, Lamium, Amblostoma*). — J. G. Baker, 'The Species of *Tulipa*' (contd.).

Magyar Növénytani Lapok (Ap. & May). — F. Schaarschmidt, 'On the division of *Synedra Ulna*.' — Id., '*Phylctidium Haynaldii*, n. sp. (1 tab.)—L. Simkovics, '*Quercus Haynaldiana*, n. sp., and other Hungarian Oaks' (1 tab.).

Midland Naturalist. — J. E. Bagnall, 'Flora of Warwickshire' (Compositæ, contd.).

Nature (May 17).—A. G. Nathorst, 'Fossil Algæ.' — (May 24). H. Müller, 'Effect of change of colour in flowers of *Pulmonaria officinalis* upon its fertilisers.'

Nuovo Giorn. Bot. Ital. (Ap. 30). — M. Lojacono, 'Revisione dei Trifogli dell' America septentrionale' (*Trifolium Hemsleyi*, *T. Potosanum*, *T. goniocarpum*, *T. Plummeri*, *T. appendiculatum*, *T. Watsonii*, *T. Grayi*, *T. Neolagopus*, spp. nn.; 3 plates). — F. v. Mueller, 'Nota sulla *Helmholtzia glaberrima* Carucl.'—L. Macchiati, 'Gli afidi pronubi.' — Id., 'Ancora sugli anestetici delle piante.'—A. Mori, 'Ancora sui prodotti che si formano nell' allo dell' assimilazione nelle piante.' — A. Penzig, 'Appunti sulla struttura simpodiale della Vite' (1 plate).

Œsterr. Bot. Zeitschrift. — L. Celakovsky, '*Ranunculus granatensis* Boiss.' — G. Beck, '*Inula hybrida* Baumg.' — B. Blocki, 'Beitrag zur Flora Galiziens und der Bukowina' (contd.) — J. B. Keller, '*Rosa reversa* W. K.' — V. v. Borbás, 'Rhodo-und Bathographische Kleinigkeiten.'—P. G. Strobl, 'Flora des Etna' (contd.).

Pharmaceutical Journal (May 5). — B. H. Paul, 'Results of Analysis of Cinchona Bark grown in Jamaica.' — (May 12). 'The Cultivation of the Poppy in European Turkey.'

Revue Mycologique (Jan.). — N. Patouillard, 'Sur la localisation de l'Hymenium.' — E. Heckel, 'Tératologie Cryptogamique.' — C. Gillet, 'Nouvelles Hyménomycètes' (*Inocybe commerifolius*, *I. rubescens*, *I. Gaillardi*, spp. nn.). — (April), C. Roumeguère, 'Memoir of Cesati.'—Id., 'Rapports entre le mycelium filamenteux constituant l'ancien genre *Ozonium* Link, et divers Hyménomycètes.' — E. Lambotte, 'De la reproduction des Ascomycètes.' — Portrait of C. Roumeguère.

Science-Gossip. — J. Spencer, 'Recreations in Fossil Botany.'—C. Parkinson, 'Botanising among the Sandhills, Isle of Wight.'

BOTANICAL NEWS.

Mr. H. Marshall Ward has been elected Fellow of Christ's College, Cambridge.

Sir J. D. Hooker has been awarded the 'Founder's Medal' by the Royal Geographical Society, and has also been elected a Foreign Associate of the U.S. National Academy of Sciences.

Dr. Bretschneider, the well-known Russian botanist and sinologue, whose recent contributions to our knowledge of Chinese Botany were noticed at some length in this Journal for 1882, is about to leave China, and, on his return to Europe, will devote himself to working at the flora of China and kindred subjects.

Surgeon-Major J. E. T. Aitchison has been recommended for election to the Royal Society by the Council of that body.

Mr. J. G. Baker is delivering a course of lectures on Saturday afternoons at the Chelsea Botanic Garden.

OBITUARY.

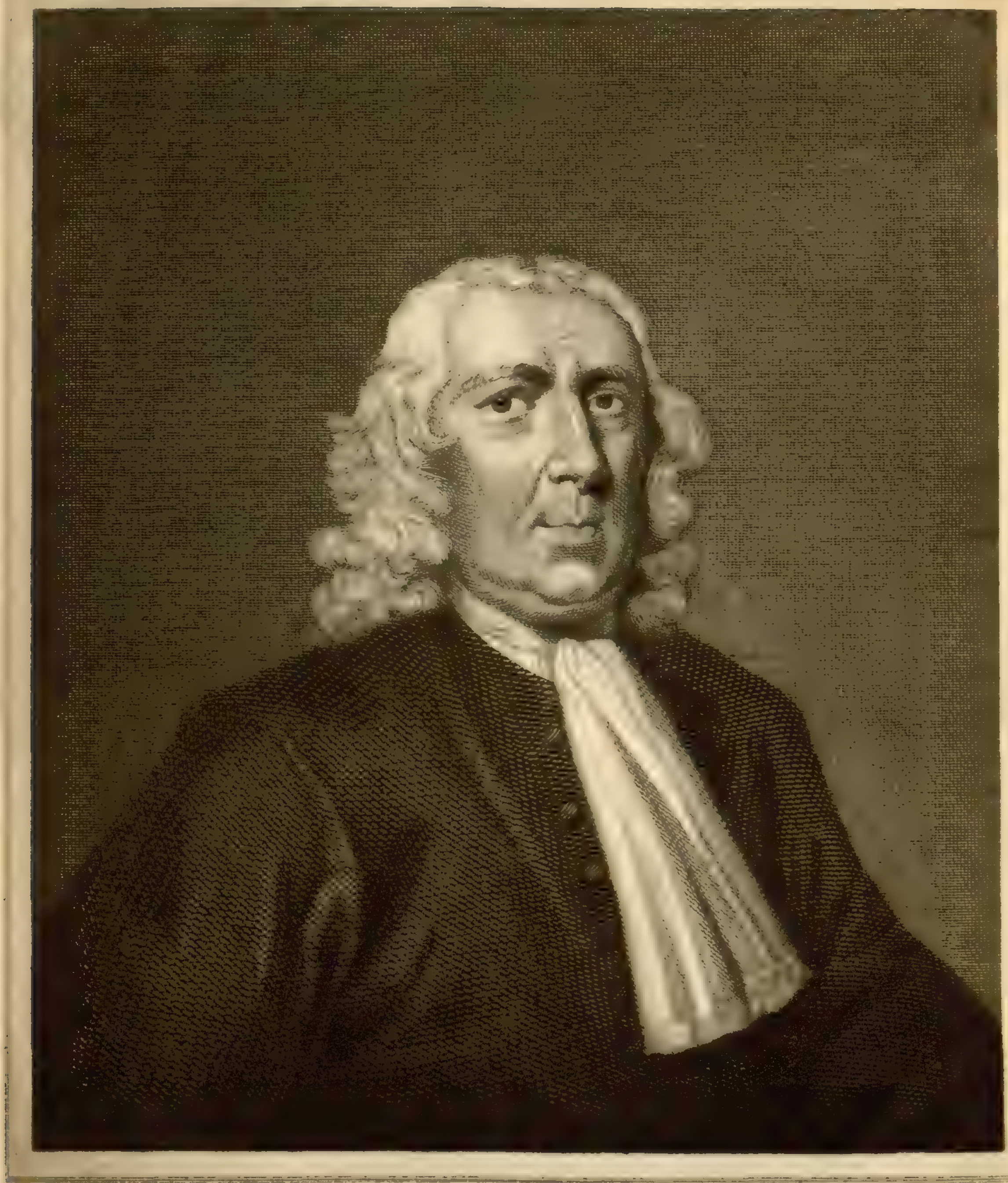
Frederick Naylor died at Kew on the 21st December last, aged 71. Mr. Naylor had a fair acquaintance with British flowering plants, in a general rather than a critical sense, and contributed three papers — 'On the Flora of Jersey,' 'On Rare Plants collected [in 1863] in the South-west of England,' and 'On *Asplenium Petrarchæ* D.C., as an Irish Plant'—to the Transactions of the Botanical Society of Edinburgh, of which he was a Fellow. He had a large and valuable collection of the autographs of botanists.

Baron Vincent Cesati, Director of the Botanic Garden at Naples, and until recently Professor of Botany at the University there, died on the 13th of February last. He was born at Milan on the 24th of May, 1806. His attention was mainly devoted to Fungi, upon which he published numerous memoirs; but his earlier publications were upon flowering plants, among which may be mentioned that on the *Umbelliferæ* of the Swiss, German, and North Italian Floras (1836), and the 'Stirpes Italicæ rariores' (1840), for which he also drew the plates. His last work, a bibliography of Italian Algology, appeared in the Comptes-rendus of the Naples Academy of Sciences in 1882.

William Horsefield, one of the 'working-men botanists' of Manchester, died at Besses-o'-the-Barn, near that town, on the 17th of January last. He was born at the same place on April 16th, 1816, and was the son of John Horsefield, a well-known member of the Banksian Society of Manchester. From his boyhood he entered heartily into the study of botany, and in company with another well-known botanist, James Percival, he rambled over some of the most beautiful parts of Yorkshire and Durham. For many years he was president of the Prestwich Botanical Society, and for upwards of twenty years he faithfully filled the office of postman at Whitefield. He was highly respected in the neighbourhood in which he lived as a man whose character was without reproach. He was returning from a meeting of the Botanical Society when he was seized with an illness from which he never rallied.

Edwin Clough, of Ashton, another of the old Lancashire botanists, died, after a short illness, on the 8th of February. He took an active part in the formation and management of many of the working men's botanical societies of that district.

Dr. William Edward Steele, Director of the Science and Art Museum, Dublin, died at that place on May 6th, aged 66. He was the author of a 'Handbook of Field Botany,' published at Dublin in 1847, of which a second edition appeared in 1851, but does not appear to have paid any special attention to Irish plants. He took his degree of M.D. at Dublin University in 1837, and was a Fellow of the Irish College of Physicians; he was for some time assistant Secretary of the Royal Dublin Society. About three months before his death Dr. Steele was seized with an attack of paralysis, from which he never recovered.



SAMUEL DALE M. L.

SAMUEL DALE.

(With Portrait.)

In the course of my tracing the history of botany in Essex, I came to the life and works of Samuel Dale, the neighbour and executor of Ray, and found that less was known of him than his great critical acumen and knowledge deserve. I also looked through his valuable herbarium, transferred some years ago from the Apothecaries Company's Garden at Chelsea to the British Museum, and from his own admirably drawn up and neatly written labels many of the facts of the following biography are obtained.

Samuel Dale is said to have been born in 1659, which date agrees with the inscription "ætatis suæ 78" on his portrait engraved by Geo. Vertue, 1737, and prefixed to the third edition of the 'Pharmacologia,' published in that year. He was apprenticed on the 5th of May, 1674, as the "son of North: Dale of ye parish of St. Mary Whitechappell in County Middlsx. silk-thrower . . . to Thos. Wells for 8 yeares;" but as he seems never to have practised as an apothecary in London it was not necessary for him to take out his freedom as a member of the Society of Apothecaries, and he seems never to have done so.

A manuscript note by Dawson Turner in a copy of Pulteney in the British Museum says, "He was born at Braintree about 1658." The year may be more probable than 1659; but I have been unable, as yet, to confirm the statement as to the place of his birth.

He settled at Braintree, practising apparently both as a physician and as apothecary, though the biographical dictionaries copy one another in saying as apothecary only. Ray, in the Preface to the first volume of his 'Historia Plantarum' (1686), alludes to him as "D. Samuel Dale, Medicus et Pharmacopæus vicinus et familiaris noster, Brantriæ in Essexia degens, qui libris diligenter collatis Synonyma examinavit, errata correxit, et omissa supplevit, præterea siquas species per incuriam aut festinationem omissas observavit, me commonefecit, ut ejus ope Historia nostra aliquot mendis repurgata, et speciebus aucta sit."

This was only written about seven years after the return of the great naturalist to his childhood's home (1679); but Pulteney's surmise that "it is highly probable, that from their vicinity to each other, Dale owed to Mr. Ray his attachment to natural history and the great proficiency he so early made in that study," is, as we shall see, confirmed by a statement by Dale himself. When Ray thus wrote of him he was not more than six or seven and twenty, and a careful comparison of the work of the teacher and that of the disciple will probably convince most people that the latter, confining his attention to a more limited field, reached a far higher pitch of critical accuracy of detail.

In 1688 Ray printed the small supplement to his 'Catalogus,'

known as 'Fasciculus Stirpium Britannicarum post editum Plantarum Angliæ Catalogum observatarum a Joanne Raio et ab amicis,' which consists only of 27 pages. It contains several plants collected by Dale in various parts of Essex, and he is again spoken of as "medicus et pharmacopæus," *i.e.* both as physician and apothecary. In the Preface to the 'Synopsis Methodica Stirpium Britannicarnm' (1690) he is styled "Pharmacopæus, Brantriæ in Essexia Medicinam faciens."

In 1692 Dale sent to Plukenet a specimen of *Malaxis paludosa*, which was figured by the latter in his 'Phytographia' (1691–2), 247, and in the same year commenced a series of 84 letters from him to Sloane—which are extant (Sloane MSS. 4042), and extend from June, 1692, to February, 1736,—and his contributions to the 'Philosophical Transactions,' which are nine in number and occur from vol. xvii. to vol. xxxix., *i. e.* over the same term of years. The first of these (Phil. Trans. no. 197) consists of queries as to "Entalia, Dentalia, Blatta byzantina, Purpura and Buccina of the shops," and his earlier letters to Sloane consist mainly of enquiries as to the cases of his patients, requests for the loan of books, and more particularly for suggestions as to the various editions of the 'Pharmacologia.' This, Dale's chief published work, first appeared in duodecimo in 1693, its full title being 'Samuelis Dale Pharmaco. logia, seu manuductio ad materiam medicam: in qua Medicamenta Officinalia Simplicia, hoc est Mineralia, Vegetabilia, Animalia, eorumque partes in Medicinæ officinis usitata, in methodum naturalem digesta succincte et accurate describuntur. Cum notis generum Characteristicis, Specierum Synonymis, differentiis et viribus. Opus Medicis, Philosophis, Pharmacopæis, Chirurgis, &c. utilissimum.' It is dedicated "celeberrimo collegio Regali Medicorum Londinensium" by the "devotissimus autor," and was perhaps the first systematic work on the subject. In the Preface he acknowledges the assistance of Ray, Sloane, Tancred Robinson, Plukenet, keeper of the king's garden, Dr. Martin Lister, F.R.S., Doody, keeper of the Chelsea garden, and James Newton, and makes also this important statement:—

"Primo initiatus sub Auspiciis Excellentissimi Viri et Reipublicæ Philosophicæ Principis Dignissimi, Joannis Raii, progressus feci et militavi non sine fructu. Testes sint Elucubrationes meæ Botanicæ Anglice scriptæ et lucem favente Numine, aliquando visuræ; taceo opusculum hoc leviusculum et impolitum sed Tyronibus haud inutile."

Thus it would seem that Dale, thirty years the junior of Ray, succeeded Willughby (who died in 1672) as his disciple and fellow-worker, a relation which continued between them for the remaining five and twenty years (1679–1705) of Ray's life.

Since there is a long review of the 'Pharmacologia' in no. 204 of the 'Philosophical Transactions,' published in October, 1693, the work must have appeared earlier in the year; thus preceding Dale's three next communications to the Royal Society, which belong to the same year. The first of these is "An Account with figures of three Saxon coins dug up at Honedon in Suffolk," dated

September, 1693, and appearing in Phil. Trans., no. 205, vol. xvii., p. 874. In the same number, p. 970, is a letter from Dale to John Houghton on "Bread made of Turneps in a scarce season," that of 1693, dated December 6th; and in no. 211, vol. xviii., p. 158, is his account, in a letter, dated October 27th in the same year, to Dr. William Briggs, M.D., F.R.S., of "the case of a woman who laboured under an obstinate Jaundice, accompanied with that defect of sight which Pathologists have called Ambyopia Crepuscularis; in which vision is quite lost after sun-set and gradually returns as day-light comes again."

No doubt at this period of his life Dale, in pursuit both of his profession and of his hobby, closely connected as they then were, visited the greater part of the county in which he lived, his journeys often extending into Suffolk. This is testified by the records on his authority in the two editions of Ray's 'Synopsis,' and by the generally dated labels of his (Dale's) Herbarium. In this there are hardly any specimens earlier than the date of the first edition of the 'Pharmacologia,' nor does it contain records of his visits to London and more distant places prior to 1709. Like most botanists of his time he did not confine his attention to flowering plants, and in the second edition of the 'Synopsis' (1696), in which Ray speaks of him as "Rei Botanicæ scientiâ penitus imbutus, sæpius à me nec immerito laudatus," besides many other records, there is a short "fasciculus" of fungi, received from him after the work was in type. Ray was now attempting the task, then almost as superhuman as it was in the time of Linnæus, of becoming acquainted with the entire natural history of the globe, and as might be expected the accuracy in detail of the 'Historia Plantarum,' and in critical discrimination in the 'Synopsis,' suffered from the very wideness of view which gave us the 'Methodus.' He was, moreover, sixty-two when the first edition of the 'Synopsis' appeared, and sixty-eight at the publication of the second; and his delicate health and enormous literary toil kept him much at home. Thus he relied upon Dale for plants even from the neighbourhood of Black Notley, which is but little more than a mile from Braintree, and, as he says plainly on many of his admirable herbarium tickets, Dale was able in many cases to show how plants had been not only omitted, or wrongly placed in the 'Historia,' but often repeated under two or three different names.

In Phil. Trans. no. 238, vol. xx., p. 91, is "An account of a very large Eel, lately caught at Maldon in Essex; with some considerations about the Generation of Eels, by Mr. Dale," dated March, 1698. In no. 249, vol. xxi., p. 50, is "Part of a letter of Mr. Dale from Braintree, dated February 1st, 1699, to Dr. Martin Lister, Fellow of the College of Physicians and R. S., concerning several insects," in which he sends "Cervus volans" from Colchester, Scarabs, Cantharides, and Ladybugs, and notes sea-mice and various "cochleæ marinæ" as observed at Harwich during the preceding summer. It was probably at this time (1698) that Dale discovered the fossil shells of the Crag, for which, as he says in a later work, he received due credit from Dr. Woodward.

Whether previously acquainted with Petiver or not, it is not until after the visit of the latter with Buddle to Ray, in 1699 (Sloane MSS. 4039, fol. 275), that the 24 letters to him from Dale, which are preserved in the Sloane collection (Sloane MSS. 3322), commence. The first of these, dated May 13th, 1700, exhibits that interest in the "herborizings" of the Society of Apothecaries which appears in many ways in Dale's life. It opens thus:—

"Dear Pettiver, Hapning upon the Orchis Anthropophora Oreades Fœm: Col. and Arachnites sive Sphegoid. hirsuto folio &c., I have sent you some against your herborizing day tomorrow." . . . The plants mentioned are *Aceras anthropophora* and *Ophrys aranifera*. In another letter, dated October 23rd in the same year, is the following reference to Ray's work at the third volume of the 'Historia':—"Mr. Ray is now describing Dr. Sherrard's plants, and if please to communicate yours they will be very acceptable to him. . . . . My service to Dr. Sloan & Mr. Buddle."

It was probably owing to his close connection with Ray that Dale, especially after his teacher's death, was brought into such close intercourse with London botanists. He may possibly have had an earlier herbarium; but among the earliest in date of the specimens now in the British Museum, some few of which go back to 1692, are plants received from Dr. Edward Bulkley at Madras, between 1701 and 1712, and from a brother of Mr. DuBois, of Mitcham, who was at Fort St. George (*i. e.* Madras), in 1703. After Ray's death, and still more after the year 1710, he seems to have visited London frequently, and the number of correspondents with whom he exchanged plants considerably increased.

In Phil. Trans. no. 291, vol. xxiv., p. 1568, is the letter to Edward Lhwyd on the fossils in Harwich Cliff, dated February, 1703, in which Dale enumerates twenty-eight species of Mollusca, and shews himself to be also acquainted with their occurrence in the Crag at Bawdsey and elsewhere. Since the encroachment of the sea has now removed all the Crag that then capped Harwich Cliff, Dale's observations possess more than a merely historical interest, and have been duly made use of in the 'Memoirs of the Geological Survey.'

From a letter from him to Petiver, dated June 9th, 1703, referring to a visit of Compton to Ray, it is perhaps worth while to quote the following sentence:—"The Bishop of London, in a visit he did Mr. Ray the honour to give him lately, acquainted him that Mr. Tournefort's Corallarium was come to England, and that Mr. Newton's Herball hath been some time published." The work here alluded to was probably that 'Enchiridion Universale Plantarum,' of which, according to Dryander, only the first book was printed (See Trimen & Dyer, 'Flora of Middlesex,' p. 389). With reference to its author's acquaintance with Ray, the following herbarium-label of Dale's, which probably refers to some time prior to 1695, when Ray recorded the locality for *Trifolium ornithopodioides* in Gibson's Camden, may be of interest: "Fœnum græcum humile repens, Ornithopodii siliquis brevibus erectis Raii Synop. iii. 331. . . . . Mr. Jos. Andrews gave me this speci-

men, who found it. Mr. Newton, in company with Mr. Ray & myself, shew'd it us on a sandy bank in Tolles-bury, Essex."

In 1704 appeared the last completed work of Ray's life, the third volume of the 'Historia,' and in the Preface to it Dale, along with Dr. Tancred Robinson and Edward Lhwyd, is once more thanked for his assistance, in the words: "hi sunt triumviri, quibus in opere hoc locupletando præcipue debitores sumus."

Closely following the publication of this work come the melancholy series of letters from Dale to Petiver and Sloane, referring to the death of his illustrious friend and teacher. On the 10th of January, 1704 (1705, New Style), he writes to the former: "Last night I visited our worthy friend, Mr. Ray, and found him so bad as not like to continue many days." Under date the 17th, he writes: "Yesterday I was againe to visit our worthy good friend Mr. Ray, whome I found alive and yt. was all, his sences being fleeting and not well to be understood what he said"; and two days later he writes: "The post by which I sent my letter of the 17th had not been got out of town above a quarter of an hour, before the dolefull but expected tidings of the death of our good friend was brought me."

Derham, whose life of Ray was largely based on information furnished him by the widow and by Dale, says "all his collections of natural curiosities he bestowed on his friend and neighbour, Mr. Samuel Dale, author of the 'Pharmacologia,' to whom they were delivered about a week before his death."

On January 24th, Dale wrote to Sloane with reference to the income (much less than the £60 annuity that died with the naturalist) left to Mrs. Ray and her three daughters, mentioning the amount already written of the 'History of Insects"; and he seems to have sent the letter in Phil. Trans. vol. xxv. p. 2282, "giving an account of what manuscripts were left by Mr. John Ray, together with some 'Anatomical Observations' made at Padua by the said Mr. Ray." Sloane seems to have suggested that Dale should complete the 'History of Insects'; but the latter seems to have measured well the limitation of his own powers. "I heartily thank you," he replies, on February 23rd, 1704, "for your good opinion of my ability to perfect Mr. Ray's 'Historia Insectorum'; I must confess my inclination is good to serve both the widow and the publick, but believe this undertaking to be above my sphere. Were it only to finish the English part, I do not doubt but that with your assistance to do it (being better acquainted with Mr. Ray's insects than any man), but the exotic part I cannot fathom, it requiring more brains and time than I can give, nor am I master of so good language as anything joyned to Mr. Ray's would deserve."

G. S. Boulger.

(To be continued.)

NOTES ON *RANUNCULUS FICARIA* L.

By Thomas Hick, B.A., B.Sc.

The position assigned to this plant by systematists has undergone some variation from time to time, but at present, by English botanists at any rate, there seems to be a disposition to accord it only specific, or at most subgeneric, rank.

By Dillenius and De Candolle it was regarded as constituting a distinct genus, though I am not in a position to state on what grounds this was done. 'The Treasury of Botany,' edited by Lindley & Moore, contains a description of *Ficaria* as a genus, distinguished from *Ranunculus* "by its having 3 deciduous sepals instead of 5 persistent sepals, and 9 petals instead of 5." "In all other respects" the description goes on to say, "it is a true Crowfoot."* In the English edition of Le Maout & Decaisne, it is stated, in the account of the genus *Ranunculus*, that "*Ficaria* has been separated from having 3 sepals,. 6–9 petals, and obtuse carpels."† On the other hand Sir J. E. Smith, following the example of Linnæus, described the plant as a species of *Ranunculus*,‡ as does Sir Joseph Hooker,§ who however makes a separate section for it, characterised, mainly, by "the chiefly radical" leaves, the 3–5 sepals, 8–12 petals and beakless achenes.

Perhaps, however, the most recent authoritative statement on the position of *Ficaria*, is that contained in the 'Genera Plantarum' of Bentham and Hooker, which it may be well to quote :—

"Ficaria Dill. ex D.C. Syst. Veg. i. 304.—Species unica Europæa, ob sepala sæpius 3, petala ∞, et stylos brevissimos a *Ranunculis* olim separata, ab auctoribus hodiernis iterum cum illis jungitur; characteres enim iidem in aliis pluribus species occurrunt."‖

It would seem then that both by the older and later authorities the number of sepals and petals, and the form of the carpels, have been considered the chief points of difference between this plant and the *Ranunculi*, and according as these were deemed sufficient or insufficient for the purpose, it has been accorded or refused the dignity of generic rank.

It would be extremely rash on my part to attempt to decide a matter on which the authorities referred to have disagreed, but additional light may perhaps be thrown upon it by a brief account of some other important differences, which, so far as I am aware, have not been previously described.

If a number of well-grown specimens be collected and carefully examined in the fresh state, it will be found that, in spite of some individual variation, they all approximate more or less closely to one type of organisation. The flowers are in every case terminal structures, developed at the extremities of the central axis and the

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* *Loc. cit.* art. *Ficaria*.
† *Loc. cit.* p. 178.
‡ 'The English Flora,' vol. iii. p. 47.
§ 'The Student's Flora of the British Isles.'
‖ 'Genera Plantarum,' i. 6.

successive lateral branches, as is the case with the *Ranunculi* generally. But the leaves are in the main *opposite*, and not seldom, particularly in the taller plants, decussate also. Many specimens are to be met with in which the opposite phyllotaxis is departed from at one or more nodes of each individual plant, but a simple application of the statistical method will show that opposition is the prevailing leaf arrangement. While this paragraph was being written six specimens were collected quite at random, on which there was a total of 39 nodes. Of these 28 bore opposite leaves, single leaves being present at the remaining 11. It should be noted, however, that in these specimens the nodes with single leaves were all on the peduncles of the flowers, the main stem and lateral branches in every case showing the opposite arrangement. On the other hand instances occasionally occur in which a unifoliar node is met with on a stem or a branch, but this is quite exceptional. At the base of the stem the leaves are reduced to mere membranous scales, but in these the same arrangement may often be seen as is met with in the ordinary leaves. Moreover in the young plants just sprouting from detached tubers, which come up in the spring, the same phenomena are demonstrable. In such plants the tuber is often surmounted by two small opposite scales, from between which is continued the central axis. At the first node on this axis are a pair of opposite scales, followed by a pair of ordinary green leaves, with long petioles, which are also opposite. Hence the opposite-leaf arrangement may be regarded as the normal one in *R. Ficaria*, an arrangement in which it differs conspicuously from the other species of the genus.

Passing on to the flowers, careful examination reveals important differences here also. The number of sepals and petals has already been referred to, as having long ago attracted the attention of botanists, and as having received due consideration. But the *arrangement* of these organs appears to have been overlooked, or at any rate has not been set prominently forward. It must be allowed that in this arrangement, as in the number, there is a certain amount of individual variation; but if we again apply the statistical method, we shall find that in the great majority of cases the calyx and corolla are fundamentally *trimerous*, and not *pentamerous* as are the other *Ranunculi*. In the majority of specimens, the outer envelopes of the flowers will be found constituted as follows:— 1. A whorl of three sepals, diverging from the thalamus at approximately equal angles. 2. Alternating with the sepals, a whorl of three petals, separate and distinct from the rest, from which they are readily distinguishable. 3. An inner whorl of 5 petals. Occasionally other petals are developed in addition to these, but even when this is the case the arrangement of the two whorls mentioned is not interfered with, the extra parts arising within the second whorl as though they were modified stamens.

That this is a very different arrangement from what obtains in other species, goes without saying. In these last the calyx and corolla are both pentamerous, and in no case that I have observed do the five petals form more than a single whorl. But in *Ficaria* the

calyx and the first whorl of petals each consist of three parts only. Moreover, if the second or inner whorl of petals be carefully examined, it will be found difficult to resist the conviction that its five parts have arisen by the modification of three. As a matter of fact, one of the five is often obviously larger than the other four. The four smaller petals form two pairs, and each pair occupies an angle between two of the outer petals, as though it represented a single organ. It would appear then that, theoretically, the inner whorl of petals, like the outer, consists of three parts, but that as a rule two of these give place to four by a process of *dédoublement*, and the number is increased to five. In confirmation of this view, it may be stated that on rare occasions flowers have been met with in which only *one* of the inner petals had been doubled, so that this whorl only consisted of four parts. On other rare occasions all the three inner petals were doubled, and this whorl was six-partite. In these last cases the six parts were in three pairs, and the pairs alternated with the three outer petals. When the number of petals exceeds eight or nine, the extra ones are almost invariably within the second whorl, as has been stated already.

Thus amid all the variations met with in the floral envelopes of *Ficaria*, a definite and fundamental plan is more or less clearly discernible. Of that plan the leading feature appears to be a *trimerous* arrangement, in which *Ficaria* differs not only from its nearest allies, but also from the great bulk of dicotyledons. It would seem then, that, in addition to the important differences usually recorded as distinguishing *Ranunculus Ficaria* from the species associated with it, we must recognise others of, as I think, not less importance. These are (i.) the opposite phyllotaxis; (ii.) the ternate arrangement of the outer floral envelopes; and (iii.) the separation of the petals into at least two whorls.

Whether with this accumulation of distinctive characters, *Ficaria* is entitled to regain its position as a genus, I will not, on this occasion, attempt to decide. It is clear, however, that in any case the descriptions usually given of it will need to undergo revision.

NOTES ON *CARRUTHERSIA* AND *VOACANGA*.

By R. A. Rolfe.

The genus *Carruthersia* was founded by Seemann, upon material gathered at Port Kinnaird, Isle of Ovalau, a small island of the Fijian Group; the single species, *C. scandens* Seem., being well figured (Fl. Vit. p. 156, t. 30), at least as far as the flowering specimen is concerned, for the fruit represented belongs to another plant. In the 'Genera Plantarum' (vol. ii., p. 718) a second species was added, *Kopsia ? pilosa* DC. Prodr., viii., p. 352, from the Philippines, with the following note:—"Fructus in utraque ignotus, nam quod a Seemannio descriptum versimiliter an plantam alienam (*Orchipedam ?*) pertinet." This second species is well

known, with the exception of the fruit, and must now figure as *Carruthersia pilosa*. The flowers are smaller, much more numerous, and arranged in a large terminal panicle, and the leaves very pilose. Abundant material of *Carruthersia scandens* Seem., collected by Mr. Horne, has now been received at Kew, with flowers and fruit *in situ*, which enables me to give the following description of the fruit :—Follicles elongate, slender, terete, slightly striate, and minutely puberulous, 4–6 in. long, 2–2½ lin. broad, gradually tapering from middle to an acute point; seed (not well developed) linear, subcompressed, 5 lin. long, coma of copious hairs, 1–1¼ in. long. Mr. Horne says, "Strong growing climber on trees in the forests, Viti Levu. Common in many other parts of Fiji." It has also been collected in the Island of Ovalau, by Græffe (no. 1587), There is a specimen sent by Mr. Horne, of which the genus is uncertain, as it only consists of a leaf, a portion of stem, and a fruit. The follicles are very divaricate and much stouter than in the other plant: the note says, "Large growing climber on trees in the mountain forests near Koro Suli, Viti Levu. Juice white, yields caoutchouc." It may therefore prove different when more material comes to hand.

The fruit represented by Seemann has the structure of a *Melodinus*, and most likely belongs to a specimen gathered by him in the Island of Ovalau (n. 311), which he refers to *M. scandens* Forst. It is however different from that species, and may be described as follows :—

Melodinus vitiensis, sp. nov. (*M. scandens* Seem. Fl. Vit., p. 155, *non Forst.*). Climbing; stem glabrous, striate. Leaves ovate-lanceolate or oblong, obtuse; base attenuate to short petiole, glabrous. Panicle lax; sepals ovate, acute; corolla not well developed, but covered outside, as well as the pedicels, &c., with a close cinereous scurfy tomentum. Island of Ovalau, *Seemann* n. 311.

As this is the only species of *Melodinus* known from Fiji, and gathered by Seemann, it is probable the fruit figured as *Carruthersia* belongs to it, and has by some accident been transposed. *M. scandens* Forst. differs in the subsessile leaves with subcordate bases, shorter pedicels, and the broader, more obtuse sepals.

The genus *Voacanga* was described in 1806, by Thouars (Thou. Nov. Gen. Madagasc. p. 10), but owing partly to the somewhat incomplete description, and partly to the scanty material in most herbaria from Madagascar, it has remained doubtful up to the present time. In the 'Genera Plantarum' it is doubtfully referred to *Tabernæmontana*,—"Huc etiam verisimiliter referenda VOACANGA *Thou. Gen. Nov. Madagasc.* 10, arbor Madagascariensis." E. Meyer understood the genus rightly, and described an additional species, *Voacanga Dregei* E. Mey. (Comm. p. 189), but as no less than three genera have since been founded upon this plant, no wonder the genus should still remain doubtful. The valuable collections lately received from Madagascar have done much to clear up the mystery. The indefatigable Mr. Baron has collected specimens, both in flower and fruit, of what is unmistakably the plant of Thouars, showing the structure to be identical with that of

Orchipeda, a genus founded by Blume (Bijdr. p. 1026) in 1825, upon a Javan plant. This latter name must therefore be superseded, which will necessitate the following alterations in the nomenclature—

Voacanga Thouarsii Rœm. et Schult. Syst. Veg. IV. p. 439.
V. Dregei E. Mey. Comm. p. 189.
Annularia natalense Hochst. in Flora 1841, p. 671.
Piptolæna Dregei A. DC. Prodr. VIII. p. 358.
Cyclostigma natalense Hochst. in Flora 1844, p. 828.
V. fœtida Rolfe.
Orchipeda fœtida Bl. Bijdr. p. 1027.
V. grandifolia Rolfe.
Pootia grandifolia Miq. Fl. Ind. Bat. II. p. 417.
Orchipeda grandifolia Miq. Ann. Mus. Bot. I. p. 316.

The following species probably do not belong to the genus at all:

Orchipeda sumatrana Miq. Fl. Ind. Bat. Suppl. p. 553.
O. gracilipes Miq. Ann. Mus. Bot. I. p. 316.

THREE NEW CHINESE BEGONIAS.

By H. F. Hance, Ph.D., F.L.S., Memb. Associé R. Bot. Soc. Belgium, &c.

1. **Begonia** (Parvibegonia) **leprosa,** sp. nov.—Caule horizontaliter repente, stipulis ovatis acuminatis subglabris, foliis orbiculatis basi cordatis auriculis incumbentibus margine integerrimis utrinque opacis supra quasi reticulo minutissimo punctulorum impressorum alveolatis palminerviis nervis 7 inconspicuis subtus pallidioribus æque alveolatis et insuper squamulosis 3–6 poll. diametro petiolo tripollicari cum nervis prominulis subtus ferrugineo-villoso, scapis paucifloris circ. 4 poll. longis glaberrimis fl. masc. circ. 5–floris polyandris, staminibus liberis antheris quam filamenta paulo brevioribus, perigonii phyllis interioribus stamina duplo superantibus roseis margine denticulatis, capsula breviter pedicellata oblonga pendula circ. 7 lin. longa pallida leprosa exalata indehiscenti 3–loculari septis extus sulco obsoleto notatis, placentis bifidis, seminibus ellipsoideis cinnamomeis alveolatis.

In umbra rupium, juxta pagum Sam-tin, secus fl. Lien-chau, 230 mill. pass. a Cantone, d. 8 Oct. 1881, leg. rev. B. C. Henry (Herb. prop. no. 22098.)

According to the latest arrangement of the genus, proposed by Mr. C. B. Clarke,* it would appear that this distinct species is only allied amongst Indian ones to *B. delicatula* Parish, from which however it differs in many characters.

2. **Begonia** (Eubegonia) **fimbristipula,** sp. nov.—Rhizomate tuberoso minimo, stipulis parvis ovato-lanceolatis conspicue fimbriato-laceris, folio unico radicali cordato-ovato acuminato basi æquali v. subæquali inæqualiter duplicato-serrato palminervi

* Journ. Linn. Soc., xviii., 114.

nervis subtus paulo prominulis supra sparsim hirtello subtus minute lepidoto necnon præcipue ad nervos hirto sæpe purpureo-picto ad 2½ poll. longo petiolo limbo plus minus breviore hirto, scapo gracili filiformi rubello glaberrimo 5–8 poll. longo apice dichotomo-cymoso paucifloro, pedicellis tenuibus, fl. masc. perianthii foliolis 4 oblongis exterioribus majoribus 4–6 lin. longis omnibus petaloideis glaberrimis roseis, staminibus numerosis breviter monadelphis antherarum obovoidearum connectivo haud producto, fl. fem. perianthii foliolis 3 roseis petaloideis 2 majoribus semicircularibus 3 lin. longis tertio minore angustiore, capsulæ 3–locularis tribus faciebus dehiscentis trialatæ glaberrimæ ala majore margine superiore plana inferiore sursum curvata 6-lin. longa horizontali obtusa 2 minoribus lineam tantum æqualiter latis, stylorum 3 persistentium ramis fascia torta cinctis, placentis bifidis, seminibus minutis cylindraceis cinnamomeis alveolatis.

In silva ad Ting-ü-shan, secus fl. West River, prov. Cantonensis, d. 6 Maii 1882, coll. C. Ford; in jugo Lo-fau-shan, d. 22 Sept. 1882, invenit rev. E. Faber (Herb. propr. no. 22114.)

The excellently dried specimens at my disposal have enabled me to make a very careful examination of this pretty and delicate species, the nearest ally of which I take to be *B. parvuliflora* A. DC.

3. **Begonia** (Platycentrum, Euplatycentrum) **circumlobata,** sp. nov.—Caule repente radicante, stipulis scariosis subglabris ovatis apiculatis, foliis basi æqualiter cordatis circumscriptione orbiculatis fere ad medium in lobos 7–8 lanceolatos eximie acuminatos margine grosse dentatos divisis supra opacis sparsim hirtellis subtus pallidis nervis strigosis 3½ poll. diametro petiolo 7–8 pollicari hirsuto, pedunculis folia æquantibus v. superantibus glabris paucifloris, perigonii interioris fl. masc. phyllis oblongis roseis extus medio dense fulvo-hirsutis stamina 40–50 libera 4–5 plo superantibus, capsula trialata 7 lin. alta ala majore 6 lin. longa margine superiore rectiusculo inferiore convexo.

Secus fl. Lien-chau, prope pagum Sin-shi, 200 m. p. a Cantone, d. 5 Oct. 1881, leg. rev. B. C. Henry (Herb. propr. no. 22124.)

This is probably near *B. laciniata* Roxb. !, though much more delicate, with thin non-oblique leaves, extremely like those of *Acer palmatum* Thunb. γ. *septemlobum* C. Koch, in shape.

NEW AUSTRALIAN ORCHIDS.*

By R. D. Fitzgerald, F.L.S.

Cymbidium gomphocarpus, n. sp. — Pseudobulbs about three inches long, covered with imbricate acuminate brown scales. Leaves linear, thin, two feet or more long and about half an inch wide. Peduncle about one foot long, erect. Pedicels four to seven

* [Mr. Fitzgerald has communicated types of these and other Australian Orchids to the Herbarium of the British Museum.—Ed. Journ. Bot.]

lines long. Flowers in dense racemes of about twenty to thirty, green tinged with olive; sepals and petals about six lines, oblong, hardly acute. Labellum five lines, three-lobed; lateral lobes acute, about one third of the central lobe, which is obtuse and thick. In the centre of the disk is a depression, glandular, pubescent at the sides, and made cordate by a globular gland on the upper side. Column hardly winged. Capsule club-shaped or almost terete, not globular as in *C. suave*.

Chiloglottis trilabra, sp. n.—Leaves two, sessile, oblong-lanceolate, acute, about ten lines long and four broad. One-flowered. Scape about three inches. One large sheathing acute bract below the ovary. Dorsal sepal spathulate, acuminate, about seven lines long, light red-brown tinged with green. Lateral sepals linear, about seven lines, acute, yellowish. Labellum about five lines, obovate, acute, on a broad claw. One large reflexed callus near the base and about nine or ten other large flat calli along the centre of the disk, surrounded by numerous small clavate slender calli; the large reflexed callus greenish, the others dark red-brown. The labellum itself light red-brown. Petals of the same form and colour as the labellum, except that the labellum is alone articulate and the calli on the petals are hardly so fully developed as on the labellum, and the labellum is slightly broader. Column shorter than the petals, not much curved and but slightly winged along its whole length, the wing extending behind the anther into a deeply four-toothed crest; anther with a short point. This is an interesting species from the fact that the petals being formed with the peculiarities of a labellum prove the correctness of the theory that the labellum is a transformed petal. *C. trilabra* was obtained on Mount York, in the Blue Mountains, N.S.W., and appears to be a very local species. It flowers in March.

Cirrhopetalum clavigerum, sp. n.—Creeping, rhizomes in joints of about three or four lines, covered with long hairs, especially round the pseudobulbs, producing roots below the pseudobulbs and forming dense patches. Pseudobulbs conical, from about six lines to one inch six lines long, and about five lines to one inch broad, deeply ribbed and furrowed. Leaves thick, oblong, pedicellate, from three to six inches long, about one inch four lines broad; scape from six to eight inches, slender. Bracts lanceolate, leafy. Flowers six or seven, in a horizontal half-circle, on pedicels of ten lines, a few small acute bracts at their junction. Dorsal sepal hooded, acute, dull yellow, spotted in parts with purple, about four lines long and four broad, terminated in a clavate hair, about four lines long. Lateral sepals lingulate, united from about a quarter of their length nearly to the ends, about one inch and a half long and three lines broad, acute, yellowish. Petals lanceolate, ciliate, purplish. Labellum thick, lingulate, much curved, articulate on the basal projection of the column. Wings of the column recurved at the anther, acute. The *Cirrhopetalum* which comes nearest to this species, as far as I am aware, is *C. Thouarsii* Lindley. *C. clavigerum* was obtained at Cape York, Northern Australia, and flowers in January.

Bolbophyllum punctatum, sp. n.—The description of *Cirrhopetalum clavigerum* is equally applicable to this plant, with the exception of the inflorescence. Scape one-flowered, rather slender, about two and a half inches high. A small sheathing acute bract at the base of the scape. Flower large, dull yellow spotted with red-brown. Sepals lanceolate, thick, about ten lines long and four broad. Petals lanceolate, not so thick as the sepals, about eight lines long and three broad. Labellum three lines long, thick, channelled at the base, contracted in the centre, blunt, curved, articulate on the basal projection of the column. Column short, with two prominent teeth. This plant is also from Cape York, Northern Australia, and flowers in January.

ON THE FLORA OF INNISHOWEN, CO. DONEGAL.

By H. C. Hart, B.A.

(Continued from p. 174).

Ligusticum scoticum L.—Rocks at Norvanny Point, parish of Clonmany, Cyb. Hib. Innishowen Head, Culdaff and Giveney, Dickie. Besides the above stations I have seen it at Malin Head, and in several places from the signal tower round to Malin; at Dunaff Head and along the cliffs of Erris and Leenane; shore between Dunaff Head and Leenane.

Crithmum maritimum L.—Cliffs at Knockglass, Malin, Dickie; at Malin Head, on the point a little west of signal-tower, in a couple of places. Scarce in Innishowen, and generally so in Donegal.

Angelica sylvestris L. *Heracleum Sphondylium* L.

Daucus Carota L.—Abundant. Dickie records the variety *D. maritimus* from several places.

Torilis Anthriscus Gærtn.—Frequent in the more cultivated districts.

**Scandix Pecten-Veneris* L.—Rare, W. E. H. An uncertain colonist.

Anthriscus sylvestris Hoffm.—Local, W. E. H. Near Buncrana; Fahan.

‡*A. vulgaris* Pers.—Casually and sparingly at Culmore, W. E. H.

**Myrrhis odorata* Scop.—At the village of Buncrana.

Conium maculatum L.—Rare at Culdaff, Dickie.

Smyrnium Olusatrum L.—Local, W. E. H. About Buncrana, on the west side, where it becomes rare.

Hedera Helix L.—Abundant.

‡*Sambucus nigra* L.—Local, W. E. H. Hardly native in the district.

Lonicera Periclymenum L.—Abundant.

Sherardia arvensis L.

Asperula odorata L.—Local, W. E. H.

Galium Aparine L. *G. verum* L.

G. saxatile L.—Abundant. On the summit of Slieve Snacht, 2019 feet.

Valeriana officinalis L.—Frequent, W. E. H.

Valerianella olitoria Mœnch.—About Greencastle, W. E. H.; at Innishowen Head, and between Buncrana and Fahan, in its native diminutive form, as I have seen it elsewhere on sandy ground near the sea; on Inch.

Scabiosa Succisa L.—Abundant.

Eupatorium cannabinum L.—Local, W. E. H. Innishowen Head, Glennagiveney, and Knockglass, Dickie; at Goorey, west of Malin; at the south end of Pollan Bay on to Binnion.

Petasites vulgaris Desf. — Not uncommon, especially in the southern part of Innishowen, about Inch, &c.; by the shore at the southern end of Pollan Bay; about Carndonagh; at Ardmalin North.

Tussilago Farfara L.

Aster Tripolium L.—Estuary at Culdaff; a little west of Malin Head; not unfrequent.

Bellis perennis L. *Solidago Virga-aurea* L.

Pulicaria dysenterica Gærtn.—Leenane, Lough Swilly. I have not met with this plant elsewhere in northern Donegal.

Bidens tripartita L.—Marshes at Malin Well, Dickie; muddy ground by the shore at Ardmalin Cottage.

Achillea Ptarmica L. — Very common, a characteristic plant of Donegal. At 700 feet by Lough Inn.

A. Millefolium L.—Common.

Matricaria inodora L.—Frequent. Var. *maritima* is also frequent on the coast.

Chrysanthemum Leucanthemum L.—Frequent.

C. segetum L.—Abundant. This plant was remarkably common in the year 1882 in various parts of Ireland.

Artemisia vulgaris L.

**Tanacetum vulgare* L.—Local, W. E. H. Knockglass, at Malin, Dickie; about Fahan and Carrowkeel.

Apargia hispida Willd.—Malin, &c., Dickie. I have not met with this plant in Donegal.

Leontodon Taraxacum L. *Sonchus oleraceus* L. *S. asper* Hoffm. *S. arvensis* L.

[*Crepis virens* L.—Probably occurs, but I can find no record of it in my notes.]

C. paludosa Mœnch.—Bulbein Mt.; Glennagiveney.

Hieracium Pilosella L.

H. anglicum Fries.—Crockaughrim, Coolcross and Bulbein Mts. Frequent in the mountainous parts of Donegal, and coming very near *H. iricum* upon Coolcross.

[*H. murorum* L.—This species is very scarce in Donegal, and some of the localities already recorded may belong to the following most variable form. Typical *H. murorum* grows opposite Innishowen, on the basaltic hills of Ben Evenagh, on the Derry side of Lough Foyle.]

H. vulgatum Fries.—Crockaughrim and Coolcross, where the form *H. gothicum* also occurs.

H. crocatum Fries.—Steep banks above the sea south east from Glennagiveney. The species was determined by Baker.

Lobelia Dortmanna L.—Lough Naminn and Lough Fad in the Mintiaghs.

Jasione montana L.—Common, especially in the northern part of the district.

Campanula rotundifolia L.

Arctostaphylos Uva-ursi Spr. — Abundant at the southern extremity of the Erris Mountains, between Dunree and the two lakes.

Calluna vulgaris Salisb.; *Erica cinerea* L.; *E. Tetralix* L.—Abundant. *E. cinerea* rises to 1540 feet on Slieve Snacht. *E. Tetralix* to 1150 feet. *Calluna vulgaris* to the summit of Slieve Snacht, 2019 feet.

Pyrola media Sm. — Mentiagh Glen, Cyb. Hib. Glen near Carrowkeel, W. E. H.

Vaccinium Myrtillus L.—Abundant. At the summit of Slieve Snacht, 2019 feet.

V. Vitis-idæa L.—Bulbein Mount. Slieve Snacht and Slieve Main, from 1420 to 1550 feet.

Ilex Aquifolium L.—Frequent in thickets and mountainous situations, as at Crockaughrim and at the Mintiaghs.

**Ligustrum vulgare* L.—Established along the railway at Fahan.

Fraxinus excelsior L.—Not common. Apparently native about Goorey, west of Malin.

Erythræa Centaurium Pers.

Gentiana campestris L.—Plentiful on dry pastures in the neighbourhood of the coast, especially northwards, as on Doagh Island and at Malin Head.

Menyanthes trifoliata L.

Convolvulus arvensis L.—Very rare in Donegal. Between Moville and Greencastle, and at Stroove, W. E..H. Sandy banks on the inner side of Leenane, Lough Swilly; Inch Road.

C. sepium L.—Common. The pink variety occurs about Moville and elsewhere. W. E. Hart has noticed that the more pink the flowers the narrower the leaves become, and he showed me some leaves remarkably hastate,—reduced almost to three linear lobes.

Lycopsis arvensis L.—Local, W. E. H. Leenane; between Innishowen Head and Greencastle; Culdaff; Ardmalin; near the R. C. Chapel, west of Malin and at Ardmalin South on the west side of Malin Head; Doagh Island.

Symphytum officinale L.—"White variety at Glen Giveny, Innishowen, and also at Malin Well," Dickie.

[*Borago officinalis* L.—By the railway at Fahan, an escape from cultivation.]

Mertensia maritima Don.—In small quantity on the strand below Ardmalin Cottage; very plentiful on the stony beach beneath the coastguard station. These stations are both on the north-east face of Malin Head. On the west side it grows sparingly in one place

about a mile and a half from the Signal tower. Elsewhere in Donegal I have met with this rare and handsome plant only in Rossgull. In the 'Cybele Hibernica' is a record for this species, "Point of Nonvany, Donegal," which is in Innishowen.

Myosotis repens Don.—Near Ardmalin Cottage.

M. cæspitosa Schultz.—Frequent, especially about Ardmalin.

M. arvensis Hoffm. *M. versicolor* L.

[*Hyoscyamus niger* L.—One plant at Greencastle, W. E. H.]

Solanum Dulcamara L.—Walls of Derry, Dr. Moore, Ord. Surv. Rept.

Orobanche Hederæ Duby.—Very rare in the north of Ireland, and I was glad to find a second locality on the ivy rocks above Goorey School House, west of Malin. The only other habitat in the north of Ireland is on the west shores of Lough Swilly.

†*Verbascum Thapsus* L. Railway banks at Fahan, where it was first shown me by Dean Gwyn.

Digitalis purpurea L. *Scrophularia nodosa* L.

Scrophularia aquatica L. — Plentiful in ditches by the railway and near it about Inch Road, Burnfoot, Bridgend, &c., along the river. This species is not so common as I at one time supposed it to be. It is, however, plentiful at Ramullan as formerly recorded. It is a much commoner species in the south of Ireland.

Melampyrum pratense L.—Glengad Head; woods about Carndonagh. Sparingly distributed.

Pedicularis palustris L. *P. sylvatica* L.

Rhinanthus Crista-galli L.—Frequent. At 850 feet on Coolcross.

Bartsia viscosa L.—An account of the range of this species in Innishowen has been given at p. 49.

Euphrasia officinalis L. — Abundant and very variable. A remarkable form has been gathered upon Innistrahull.

E. Odontites L.

Veronica serpyllifolia L.—Abundant, W. E. H.

V. Anagallis L.—Frequent, W. E. H. Malin estuary, and elsewhere.

V. Beccabunga L.—Very common. In ditches about Carndonagh this plant takes the place of *Helosciadium nodiflorum*.

V. Chamædrys L. *V. officinalis* L.

V. hederifolia L.—About Derry, W. E. H. Scarce in Donegal.

V. arvensis L. *V. agrestis* L.

*†*V. peregrina* L.—Kilderry garden, near Muff. In many places from east to west of Donegal this has become the commonest garden weed. Except in gardens I have not met with it.

Mentha aquatica L. *M. arvensis* L.

‡*M. piperita* Sm.—By the old road near Muff, in Derry, D. M. I saw what I believe to be this species by the side of an old road between the Scalp and Inch Road Station, but I have not examined it satisfactorily.

Thymus Serpyllum L.—Abundant.

Calamintha Clinopodium Benth.—On the west bank of the Foyle, near Londonderry, sparingly, Cyb. Hib. One of the rarest plants in Ireland.

Prunella vulgaris L. *Nepeta Glechoma* Benth.

Lamium amplexicaule L.—Ardmalin; at Ardmalin South, on the west side of Malin Head; Doagh Island; Inch Island.

L. intermedium Fries.—Doagh Island and at Ardmalin South, on the west side of Malin Head, in company with the following:—

L. incisum Willd.—Stroove; about Malin, &c., not unfrequent.

‡*L. album* L.—A weed at Kilderry, W. E. H.

L. purpureum L.—Frequent.

Galeopsis Tetrahit L.—Abundant.

G. versicolor Curt.—Leenane, and between that and Bulbein, &c.; between the Scalp and Inch Road; frequent, W. E. H.

(To be continued.)

ASPLENIUM GERMANICUM WEISS. IN HONGKONG.

By F. B. Forbes, F.L.S.

I am able to note a small but interesting addition to the recorded flora of Hongkong. In 1874, a collection of plants of that island was made for me by a Chinese, engaged through Mr. Ford, Superintendent of the Hongkong Government Gardens. In laying out the specimens into my herbarium, I disentangled from some roots of *Drymoglossum carnosum* Hook., a small fern, which was submitted to Mr. Baker in 1876, and pronounced by him to be *Asplenium germanicum* Weiss. On my return to China I communicated the specimen to Dr. Hance, who confirmed the determination, adding that he was quite ignorant of the occurrence of the plant in Hongkong, nor am I aware that it has been again gathered there.

The geographical distribution of this little fern, as given by Milde,* is throughout most mountainous regions of Europe; in Germany, Belgium, the Vosges and Jura Mountains, Switzerland, France, Portugal, England, Scotland, and Scandinavia; rarer in chalk formations; *wanting* in nearly all Russia, the Caucasus, in Asia, Africa and America.

There is, however, in the Kew Herbarium a specimen of *A. germanicum*, gathered by the late Dr. Stewart in the Ravibasi, Chumba territory (Western Himalayas), at an elevation of 6,000 feet above sea level. Mr. Baker kindly drew my attention to this specimen, which, by some oversight, was not mentioned by Mr. C. B. Clarke in his Review of the Ferns of Northern India.† The range of the fern is thus found to extend from the extreme west of Europe to the eastern Asiatic coast, although, as Mr. Baker informs me, it nowhere occurs plentifully in European countries, while it would seem to be still rarer in Asia.

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* Fil. Europ. et Atlant. p. 82.

† Trans. Linn. Soc. (Bot.), vol. i., part vii.

Milde (*loc. cit.*) quotes, only to decide against them, two suppositions that this species is a hybrid, between *A. septentrionale* and *A. Ruta-muraria*, according to Bory, or, according to Ascherson, between *A. septentrionale* and *A. Trichomanes*. The two latter ferns both occur in Northern India,* but no one of the three supposed progenitors of *A. germanicum* has, to my knowledge, been yet recorded from either Hongkong or South China.

A SYNOPSIS OF THE GENUS *SELAGINELLA*.

By J. G. Baker, F.R.S., &c.

(Continued from p. 145).

58. **S. azorica,** n. sp.—Stems trailing, rooting nearly up to the tip, continuous, 2–3 in. long, with several short slightly compound branches. Leaves of the lower plane contiguous on the branches, oblique oblong, nearly equilateral, acute, $\frac{1}{8}$ in. long, rounded at the base, serrulate from base to apex along both margins, moderately firm in texture, bright green; leaves of the upper plane much imbricated, more than half as long as the others, oblique oblong-lanceolate, cordate on the outer side at the base. Spikes not yet seen.

Hab. Mountains of the Azores, *Arruda Furtado*! Lately received at Kew in a living state.

59. S. DEPRESSA A. Br. in Ind. Sem. Hort. Berol. 1859, 21; *S. denticulata* Spring, ex parte; *Lycopodium depressum* Sw.—Stems matted, trailing, 2–3 in. long, with a few mostly simple branches. Leaves of the lower plane spaced, spreading, oblong-lanceolate, subacute, flat, moderately firm in texture, 1-12th in. long, more produced on the upper side of the distinct midrib, very cordate, strongly ciliated, and much imbricated over the stem on the upper side at the base; leaves of the upper plane a third as long, ovate, little imbricated. Spikes $\frac{1}{4}$–$\frac{1}{2}$ in. long, 1 lin. diam., not regularly square; bracts lanceolate-deltoid, a line long.

Hab. Cape, *Thunberg*, *Menzies*! Orange Free State, *Cooper*! Natal, *McKen*! This is quite distinct from the European *S. denticulata*, with which Spring combines it.

60. S. GOUDOTANA Spring Mon. ii. 91. — Stems trailing, cæspitose, 3–6 in. long, pale straw-coloured, terete below, flat on the faces upwards, distichously branched, the flabellately compound branches under an inch long. Leaves of the lower plane ovate, acute, a line long, $\frac{1}{2}$—$\frac{3}{4}$ lin. broad, light green, rather rigid and glossy, flat, erecto-patent, spaced except at the top of the branches, serrulate, much dilated on the upper side at the base; leaves of the upper plane a quarter as long, ovate acuminate, straight, divergent. Spikes unknown.

Hab. Central Madagascar, near Antananarivo, *Goudot*. This

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* C. B. Clarke, *l. c.* pp. 477, 478.

has not been found yet by our English collectors, who have gathered about 200 vascular cryptogams in Central Madagascar.

61. S. FISSIDENTOIDES Spring Mon. ii. 111; *Lycopodium fissidentoides* Hook. & Grev.—Stems slender, trailing, pale straw-coloured, flat on the faces, copiously pinnately branched, the branches copiously flabellately compound. Leaves of lower plane ascending, crowded, lanceolate, acute, 1-12th to 1-8th in. long, moderately firm in texture, bright green, more produced on the upper side of the distinct midrib, shortly ciliated near the base on the upper side, where it is cordate and so much imbricated over the branch that the latter is quite covered; leaves of the upper plane a third as long, oblong, acute, much imbricated. Spikes square, $\frac{1}{4}$–$\frac{1}{2}$ in. long, $\frac{1}{2}$–$\frac{3}{4}$ lin. diam.; bracts crowded, ovate-lanceolate, strongly keeled.

Hab. Seychelles, Madagascar, Johanna Island, and Guinea. *S. amphirrhizos*, A. Br., from Johanna Island, *Hildebrandt* 1808, seems to be a luxuriant form of this species. The Seychelles plant has shorter, paler, less lanceolate leaves than the Madagascar type.

62. S. SURCULOSA Spring Mon. ii. 147.—Stems wide-trailing, pale straw-coloured, irregularly angled, a foot long, copiously pinnately branched, the short cuneate branches copiously flabellately compound. Leaves of the lower plane crowded, lanceolate, very acute, 1-12th to 1-8th in. long, firm in texture, bright green, nearly equal on both sides of the distinct midrib, shortly ciliated through the lower half of the upper edge, which is a little produced at the base, and imbricated over the branch; leaves of upper plane a third as long, oblique oblong, with a long cusp, much imbricated. Spikes unknown.

Hab. Mountains of Bourbon, *Dr. I. B. Balfour*! May be a variety of *S. concinna*, from which it differs by its narrower, acute, nearly equilateral leaves.

63. S. CONCINNA Spring Mon. ii. 199; *Lycopodium concinnum* Swartz; *L. pectinatum* Lam., ex parte; *L. apiculatum*, *sinuosum* and *sparsifolium*, Desv.—Stems trailing, reaching a foot or more in length, subterete, often forked low down, copiously pinnately branched, the lower branches cuneate and copiously flabellately compound. Leaves of the lower plane crowded, ascending, oblique oblong-lanceolate, 1-12th to 1-8th in. long, subacute, bright green, glossy, rigid in texture, more produced on the upper side of the distinct midrib, the base on the upper side shortly rigidly ciliated, and so much dilated that the branch is quite hidden; leaves of the upper plane a third as long, oblique oblong, with a long cusp, much imbricated. Spikes $\frac{1}{2}$–1 in. long, square, 1 lin. diam.; bracts ovate, cuspidate, crowded, strongly keeled.

Hab. Mountains of the Mascaren Islands, especially Mauritius; Spring's Neilgherry and Ceylon specimens are clearly both *S. plumosa*. I cannot separate *S. serrulata* Spring Mon. ii. 202 (*Lycopodium serrulatum* Desv.).

64. S. SECHELLARUM Baker, Fl. Maurit. 523.—Stems slender, trailing, about a foot long, bisulcate on the face, lengthened out and whip-like at the end, forked low down, pinnately branched, with

short cuneate flabellately compound branches. Leaves of lower plane spreading or rather ascending, contiguous on the branchlets, spaced on the branches, oblong-lanceolate, 1-12th to 1-8th in. long, acute, pale green, moderately firm in texture, more rounded on the upper side of the distinct midrib, shortly ciliated on both sides low down, cordate on the upper side at the base and much imbricated over the branch; leaves of upper plane a third as long, oblique oblong, cuspidate. Spikes $\frac{1}{4}$–$\frac{1}{2}$ in. long, square, 1 lin. diam.; bracts ovate, cuspidate, strongly keeled.

Hab. Island of Mahé, Seychelles, *Horne* 157!

65. S. CUPRESSINA Spring Mon. ii. 113, ex parte.—Stems trailing, quadrangular, 8–12 in. long, bisulcate on the face, the main branching pyramidal, the secondary pinnate, with the ends often excurrent, the branches pubescent and triquetrous. Leaves of the lower plane crowded, oblong-lanceolate, subfalcate, a line long, light green, the two sides nearly equally rounded at the base, the upper sometimes obscurely ciliated, the midrib sulcate so as to appear double; leaves of upper plane half as long, oblong or ovate, cuspidate. Spikes square, $\frac{1}{4}$–$\frac{1}{2}$ in. long; bracts ovate, acutely keeled.

Hab. Bourbon. The Asiatic plant placed here by Spring is *S. biformis* A. Br., which is doubtfully distinct from *S. plumosa*.

66. S. RODRIGUESIANA Baker, Fl. Maurit. 523.—Stems trailing, slender, pale straw-coloured, bisulcate on the face, reaching a foot in length, often forked low down, alternately pinnately branched, with short cuneate branches, the lower with 5–7 branchlets. Leaves of the lower plane spaced, rather deflexed, oblong, obtuse, 1-12th to 1-8th in. long, bright green, not so firm in texture as *S. concinna*, more produced on the upper side of the distinct midrib, obscurely ciliated low down, narrowed obliquely to the base and but little imbricated over the branch; leaves of upper plane a third as long, oblique oblong, strongly nerved, with a short inflexed cusp. Spikes $\frac{1}{4}$–$\frac{1}{2}$ in. long, $\frac{1}{2}$ lin. diam.; bracts orbicular, cuspidate, little longer than the sporangia, strongly keeled.

Hab. Island of Rodriguez, *Dr. I. B. Balfour*!

67. **S. plagiochila,** n. sp.—Stems filiform, trailing, much intermatted, 3–4 in. long, flat on the back and face, the ascending simple slightly pubescent branches pinnately arranged, simple or slightly compound. Leaves of the lower plane all spaced, spreading, oblong, obtuse, bright green, thin in texture, flat, at most 1-12th in. long, the distinct midrib nearly central, the margin obscurely ciliated all round, not specially at the base, the base on both sides equally rounded, not imbricated over the branch; leaves of the upper plane very small, spaced, ovate, erect, not cuspidate. Spikes very short; bracts ovate, acute, strongly keeled, $\frac{1}{2}$ lin. long.

Hab. Eastern Cuba, near Monte Verde, *C. Wright* 942! A near ally of *S. Homaliæ*.

68. S. HOMALIÆ A. Br. in Crypt. New Gran. 358.—Stems very slender, entirely trailing, angled on the back, much intermatted, 3–6 in. long, with ascending, distant, mostly simple branches.

Leaves of the lower plane close or slightly spaced, spreading, oblong, obtuse, 1-12th in. long, bright green, moderately firm in texture, the distinct midrib nearly central, the upper edge ciliated and cordate at the base, and imbricated over the branch; leaves of the lower plane a quarter as long, broad, ovate, acute. Spikes short, square, ½ lin. diam.; bracts ovate, cuspidate, strongly keeled.

Hab. Cataracts of Jaruma and Panuré, Upper Amazon, *Spruce* 2534! 2941! *Trail* 1437! A near ally of *S. jungermannioides*.

(To be continued.)

SHORT NOTES.

The Date of Plukenet's 'Phytographia.'—In my 'Early European Researches into the Flora of China,' I have pointed out (p. 44, note) the contradiction which exists between the date of publication (1692) given on the title-page of the third volume of Plukenet's '*Phytographia*,' and the fact that Plukenet represents in this volume many of the Chinese plants which J. Cunningham transmitted to him only *ten years* later. Now I see that in this Journal for 1882 (p. 340), Mr. Jackson also states that the third volume of Plukenet's iconographical work appeared in 1692. But this at any rate must be a mistake. Plukenet described Cunningham's plants in the 'Amaltheum,' which was issued in 1705, and, as each engraving in the 'Phytographia' is referred to the 'Amaltheum,' whilst no reference to the 'Phytographia' is found in the 'Amaltheum,' there can be no doubt that the iconographical work, the third volume at least, was brought out subsequently to 1705.—E. Bretschneider.

[I think that Dr. Bretschneider must be under some misapprehension here; possibly caused by the copy of Plukenet's works used by him having all the plates bound up in one series. Part 3 of the 'Phytographia' consists of plates 121–250, prefixed to these being an engraved title-page and prefaces, dated 1692; this part resembles its predecessors by having the descriptive phrases at the foot of each plate. Part 4 was issued in 1694, with a title-page partly in letterpress, embracing plates 251 to 328; this, the concluding part of the 'Phytographia,' differs from the others by the entire absence of descriptive phrases at the foot of each plate. The text to these was furnished by the 'Almagestum' in 1696, followed by the 'Mantissa' in 1700, with plates 329 to 350. Lastly, in 1705 the 'Amaltheum' came out, having plates 351 to 454, the references in juxtaposition to the plants depicted being to the accompanying text or that of the 'Mantissa,' whilst the text simply indicates the plate and the figure thereon. In the 'Phytographia' I have detected no allusion whatever to Cunningham's plants, whilst in the 'Amaltheum' they abound, entire pages sometimes being devoted to the enumeration of the new plants sent over by that collector.—B. Daydon Jackson.]

Astragalus hypoglottis in South Beds.—I last month found this plant growing plentifully on the Warden Hills, about three miles north of Luton. The subsoil is chalky, and the old Roman road, the Icknield Way, runs at the base of the hills. It grew in company with *Senecio campestris*, *Orchis ustulata*, and *Koeleria cristata*.—J. Saunders.

Ranunculus Drouetii Schultz., in Worcestershire.—This plant, hitherto unrecorded for Worcestershire, I have just met with at Leigh Sinton, near Malvern, growing with *R. floribundus* Bab., in one of the old marl pits so common in the neighbourhood. —R. F. Towndrow.

Ranunculus intermedius in North Devon.—Professor C. C. Babington has thus named a plant I sent him at the end of May from a muddy lane across a moor in Bridgerule, on the Devon side of the Upper Tamar. It is, I see, identical with a plant I found on a hillside near Okehampton.—W. Moyle Rogers.

Fissidens rufulus Schpr. — I gathered this moss in two localities widely apart in Bolton Woods, West Yorkshire, on the 26th of last March; it grew in rather dense tufts on rocks in the River Wharfe, associated with *Amblystegium fluviatile* Swartz, *Cinclidotus fontinaloides* Hedw., *Barbula spadicea* Mitt., and the river form of *Grimmia apocarpa* L. The plants were packed with rock *débris*, in a similar way to what obtains in the acuminate variety of *Andreæa petrophila* Ehrh., only the *débris* was coarser, though hardly so coarse as *Dichodontum flavescens* Dicks. and *Atrichum crispum* James love to revel in. The rocks it grew upon are grits of the coal measures, but there are plenty of mountain limestone pebbles in the river, washed down from above. The altitude is about 500 ft. I mention all these particulars, as I wish bryologists to keep a look-out for it in other places, this being its second British station and county. Gatherings of *F. crassipes* Wils., should be examined (especially the earlier ones), as this species occurs under precisely similar circumstances in the water-shed of the Wharfe, both above and below the station for *F. rufulus* Schpr., in one place on grit and in the other on limestone. In fact, after a preliminary glance at one or two of the younger plants (which had not acquired a rufulous tinge), I distributed several packets as *F. crassipes* Wils., but my eagle-eyed friend Mr. Curnow, of Penzance, recognised it at once, and informed me of my mistake. *F. crassipes* Wils., has larger cells than *F. rufulus* Schpr., and they are succulent-looking and very different from the more regularly rounded-hexagonal cells of *F. rufulus* Schpr.; the dry leaves too of the latter are not so crisp as those of *F. crassipes* Wils. One or two capsules and a few fruit-stalks were present; I should think it will mature fruit in late autumn. A lid was present on one capsule, the shape being decidedly conical-acuminate, thus differing from Sullivant's figure of *F. rentricosus* Lesq., which is supposed to be the same species; still as this is the only British operculum yet to hand we must wait and see.—Wm. West.

NOTICES OF BOOKS.

Handbook to the Ferns of British India, Ceylon, and the Malay Peninsula. By Col. R. H. Beddome, F.L.S., late Conservator of Forests, Madras. With 300 illustrations. Calcutta: Thacker, Spink & Co.; London: Thacker & Co., 1883. 8vo., pp. xiv. 500.

A handbook of Indian ferns in a compact form and at a moderate price has been much wanted, and no one has ever had a more thorough and practical acquaintance with these plants than Colonel Beddome. His official work for the last thirty years had caused him to travel continually among the forests of Southern India, and we are indebted to him for the set of fern-illustrations in continuation of Wight's 'Icones,' that fill the same place for Indian ferns that 'English Botany' does for our home flora. His 'Ferns of Southern India and Ceylon,' which was issued in parts and completed in 1863, contains plates of 271 species and varieties. His 'Ferns of British India,' in two volumes, which was completed in 1878, contains plates of 345 species and varieties not known within the limits of the area covered by the first volume. In a Supplement, which was published in 1876, he gives plates of 45 additional species, carrying the whole series to 660 plates, and a revised enumeration and classification of the whole. These were all brought out whilst he was still in India. He has now retired from his official position and returned to England, and has spent the first years of his leisure in working out the present handbook, which contains a complete synopsis of the Indian genera and species, full-page plates with analyses of each of his 98 genera, and a large number of woodcuts of smaller size, interspersed among the text, with a sketch of the distribution of each of the species.

The area covered is precisely the same as that included in the 'Flora of British India,' by Sir J. D. Hooker, and within its bounds are found about twenty-five per cent. of all the known ferns. Although ferns dry so easily, many of them are so large that they can only be represented very inadequately in herbarium specimens, and they are often so extremely variable in "cutting" that it is very easy to mistake a casual variation for a species. In no department of botany is the synonymy more extensive and intricate, and in none have more bad species been made. Up till a comparatively recent date nearly all that had been written about Indian ferns was by authors who had never been in India, and who therefore had had no opportunity of studying the limits of the species in the field. Now the list, as made out from herbarium material, has been twice thoroughly revised by botanists who have had ample opportunities and paid special attention to species-limitation in the field through a long course of years, first by Mr. C. B. Clarke, who published a revision of the Bengal ferns, in the 'Transactions of the Linnean Society' (N.S. Botany, vol. i.), and now by Colonel Beddome, whose experience has mainly been gained in Southern India, and who, after a leisurely comparison at home of his own collections with the types

of Wallich, Hooker, Blume and others in the London herbaria, has again reversed the whole list. The difference in the number of species which he admits, as compared with Mr. Clarke's list and the 'Synopsis Filicum,' is not so great as that between recent British floras. It is not likely that many new species of Indian ferns will be discovered, and the species have now been so thoroughly sifted that the list as it now stands will probably not be materially modified by further research. Colonel Beddome follows Presl, J. Smith, and Moore, in using genera founded often on differences of veining alone. His descriptions are, as might be expected, a great improvement upon his earlier work.

J. G. B.

Dr. L. Rabenhorst. Kryptogamen Flora von Deutschland, Œsterreich, und der Schweitz. Zweiter Band. Die Meersalgen von Ferdinand Hanck. Leipzig, 1883.

Few algologists have such advantages as Dr. Hanck for carrying out the work he has undertaken. Residing, as he does, close to the sea, and possessing a large herbarium containing a great number of type specimens, and having a large circle of algological correspondents and an extensive knowledge of species, he is peculiarly fitted to produce a flora of the most trustworthy character, and to give all that is known of the life-history of the marine Algæ. Of the three parts already issued, the first contains a chapter giving directions for collecting, examining and mounting marine Algæ, followed by another explaining the various terms used in relation to their reproductive organs. This chapter is particularly lucid and concise. Then follows a scheme of classification. Dr. Hanck divides seaweed into four groups, according to the colour of the endochrome, viz., *Rhodophyceæ*, *Phæophyceæ*, *Chlorophyceæ*, and *Cyanophyceæ*. The characters of each family follow, with a list of the genera included in each, the generic descriptions being subsequently given under their respective heads. The arrangement of the families and genera differs but little from that adopted in recent floras, such as Farlow's 'Marine Algæ of New England,' or Le Jolis' 'Liste des Algues Marines de Cherbourg,' and fairly represents the views held at the present time by leading algologists. The author has followed Agardh in placing *Dumontia* in *Cryptonemiaceæ* and *Catenella* in *Solieriaceæ*, but differs from him regarding the position of *Gloisiphonia*, which he has arranged in the *Ceramiaceæ*, between which and *Cryptonemiaceæ* it obviously forms a link. The genus *Callithamnion* is distributed as follows:—*C.* (*Chantransia*) *virgatulum*, *C.* (*Spermothamnion*) *Turneri* and *C.* (*Monospora*) *pedicellatum* are placed in the *Wrangeliaceæ*, *C.* (*Rhodocorton*) *Rothii*, *C.* (*Antithamnion*) *plumula*, *C.* (*Antithamnion*) *cruciatum*, and *C.* (*Pleonosporium*) *Borreri* being retained with the other *Callithamnieæ* in *Ceramiaceæ*. *C. pluma* is not referred to *Ptilothamnion*, although it would appear to have as much claim to a generic rank as *Pleonosporium*. In most cases mention is made of the fructification being unknown where this is the case, but it is not surprising to find that in a few instances the recorded fructifi-

cation has been overlooked, since the literature of the subject is scattered in so many different publications, some of which are not easily obtainable. Thus, the tetraspores of *Nemalion* and *Helminthora* are said to be unknown, which is not the case, those of the former being tripartite and those of the latter zonate. It must, however, have been through inadvertence that the cryptocarpic fruits of *Callithamnion thuyoides*, *C. polyspermum*, *C. Borreri*, *Ceramium tenuissimum*, and *Grateloupia ulicina* are omitted, since they are described and figured in Harvey's 'Phycologia Britannica.' It is not possible to agree with the author in giving *Sphæroccocus nicæensis* Rtz. as a synonym of *Phyllophora palmettoides*, as the very slight ebb of the Mediterranean has probably prevented him from observing the habit of growth of these species, which are found at extreme low-water mark in this country. The former has a filiform creeping stem attached at intervals, so that the plants resemble strawberries in forming a network of stolons (see Harv. Phyc. Brit., tab. cxxxiv., f. 3). The latter form extensive rounded patches, arising from a continuous spreading disk, from which numerous closely packed stems arise. The fronds are always incurved at the margins, so that the tuft resembles a rose with expanded petals. *S. nicæensis* has perfectly flat fronds, and its fructification is correctly figured by Rutzing, while the tetrasporic nemathecia of *P. palmettoides* are illustrated by Harvey in the Phyc. Brit., tab. cccx., figs. 1, 2. The work is illustrated with numerous zinc engravings, representing the plants as seen under the microscope, one or more being given in each genus. There are also five plates illustrating various species of *Lithothamnion* and allied genera, printed by the albertotype process, which give a tolerably good idea of the appearance of these singular Algæ.

The flora promises to be particularly valuable to British algologists who can read German, since it includes not only the Austrian and Italian species met with in the Mediterranean, but also those of the North Sea and Baltic as far as Heligoland, and therefore approaches in many points to that of Britain. Indeed it may serve as a guide to the species likely to be found in this country, since many Scandinavian species have been found on the Scotch coasts during the past few years, while many Mediterranean species have been met with on the southern and western coasts of England. It would have been still more useful had the exact character of the habitat of different species been indicated, together with the time of fructification. In any case, however, it will be valuable as a standard work of reference to British algologists until a new edition of the marine flora of this country is issued.

E. M. H.

Articles in Journals.—June.

American Naturalist.—W. W. Bailey, 'Mosses.'—J. E. Todd, 'Note on *Tradescantia virginica*.'

Botanical Gazette (May).—J. H. Bailey, 'Jacob Bigelow.'—E. A. Rau, 'A New Phallus' (*Phallus togatus* Kalchb.: 1 plate).—W. G. Farlow, 'Notes on Fresh-water Algæ.'

Botanische Zeitung (May 25). — H. Hoffman, 'Culturversuche über Variation' (concluded). (June 1.)—F. Tschaplowitz, 'Gibt es ein Transpirations-Optimum ?'

Bull. Soc. Bot. France (xxix. Comptes Rendus, part 4).—J. Vallot, 'Étude sur la Flore du Sénégal' (contd.).—C. Richon 'Sur le *Vibrissea hypogæa* et le *Godronia Muhlenbeckii*' (1 plate).—R. Gérard, 'Sur l'Oxalate de Chaux concrétionné chez le Gui.'—G. Gautier, E. Jeanbernat, and E. Timbal-Lagrave, 'Plantes adventives dans les Corbières.'—G. Bonnier, 'Sur la présence normale des bractées dans l'inflorescence des Crucifères.'—J. D'Arbaumont, 'Sur les ramifications de la tige des Ampelidées.'—P. Van Tieghem, 'Sur quelques points de l'anatomie des Cucurbitacées.'—M. Battandier, 'Contributions à la Flore des environs d' Alger' (*Lathyrus Allardi*, sp. n.).

Gardeners' Chronicle (June 2).—*Rodriguezia luteola* N. E. Brown, sp. n.—J. G. Baker, 'Species of *Tulipa*' (contd.).—J. Horsefield 'Wild Flowers on Wilts Downs.' 'List of Garden Orchids' (*Seraphyta*, *Hormidium*, *Scaphyglottis*, *Hexadesmia*, *Octadesmia*).—(June 9). *Oncidium saltabundum* Rchb. f., sp. n.—N. E. Brown, 'The Genera Plantarum.'—(June 16). G. Maw, 'Crocuses.' *Philadelphus mexicanus* (fig. 123), *Ixiolirion tataricum* (fig. 125), *Odontoglossum polyanthum* (fig. 126), *Cyclobothra pulchella* (fig. 127). 'List of Garden Orchids' (*Pleuranthium*, *Diacrium*, *Isochilus*, *Ponera*, *Hartwegia*).—(June 23). *Masdevallia Carderi* Rchb. f., sp. n. *M. tridactylites* Rchb. f., sp. n.—J. G. Baker, 'Species of *Tulipa*' (contd.: *T. Elwesii*, *T. cruciata*, spp. nn.). *Cypripedium pubescens* (fig. 128). *Othonna cheirifolia* (fig. 139). *Polemonium Richardsonii* (fig. 131). — J. R. Jackson, 'Tea and its Substitutes.'

Journal of Linnean Society (xx. no. 128 (June 6).—J. G. Baker, 'Contributions to Flora of Madagascar: pt. iii. *Incompletæ*, *Monocotyledones* and *Filices*' (many new species: *Cephalophyton* Hook. fil., new genus of *Balanophoreæ;* not described; synopsis of Madagascar *Cyperi* by C. B. Clarke).—G. Bentham, 'On the joint and separate work of the Authors of Bentham & Hooker's "Genera Plantarum."' —W. B. Hemsley, 'On the Synonymy of *Didymoplexis*, and the elongation of pedicels of *D. pallens* after flowering' (1 plate). — G. Murray, 'On the outer peridium of *Broomeia*' (1 plate). [See Journ. Bot. 1883, p. 160].

Longman's Magazine.—S. Smiles, 'A faithful Parish Priest' (Rev. J. S. Henslow).

Magyar Növénytani Lapok. — A. Kanitz, Life of M. Fuss (1814—1883).

Midland Naturalist.—J. E. Bagnall, 'Flora of Warwickshire' (*Compositæ* contd.).

Naturalist (May).—J. G. Baker, 'On the Present State of our Knowledge of the Geography of British Plants' (concluded).—J. Cash & E. N. Bloomfield, '*Cinclidium stygium*.'

Nature (May 31).—G. Schweinfurth, 'The Flora of Ancient

Egypt.' (June 7).—W. C. Williamson, 'Morphology of pitcher of *Cephalotus*.'

Œsterr. Bot. Zeitschrift.—W. Voss, 'Neue Pilze' (*Phyllosticta carniolica*, *Ramularia Scopoliæ*). — B. Blocki, 'Zur Flora von Galizien' (contd.) — D. Hirc, 'Zur Flora von Croatien.'—E. Formánek, 'Teratologisches.'—S. Schulzer v. Müggenberg, 'Mykologisches.' — J. L. Holmby, 'Kalnicaer Gebirge.'—R. F. Solla, 'Hölzer-Ausstellung in Triest.' — P. G. Strobl, 'Flora des Etna' (contd.).

Pharmaceutical Journal (June 2).—M. Hay, 'A new Alkaloid' (tetano-cannabine) in *Cannabis indica*.' (June 9).—J. E. Howard, 'The effect of altitude on the alkaloid of Red Bank.'—E. C. C. Stanford, 'Algin.'

Science Gossip. — J. Saunders, 'A Plea for our Charas.'—W. B. Grove, 'Notes on Schizomycetes' (concluded).—J. R. Neve, 'Notes on *Ranunculus Ficaria*.'

Transactions of Linnean Society (2d. S. ii. pt. 3, March).—M. J. Berkeley & C. E. Broome, 'List of Fungi from Brisbane' (6 plates: many new species). (Pt. 4, April)—T. H. Corry, 'Mode of Development of Pollinium in *Asclepias Cornuti*' (1 plate).

LINNEAN SOCIETY OF LONDON.

March 1, 1883.—Sir John Lubbock, Bart., President, in the chair.—The following gentlemen were elected Fellows of the Society:—W. B. Barrett, L. J. K. Brace, J. B. Bridgman, W. O. Chambers, W. E. Clarke, W. Godden, F. H. H. Guillemard, J. E. Havers, T. M. Hocken, C. H. Middleton-Wake, James Stirling, Rev. P. W. Wyatt.—Mr. R. F. Towndrow showed examples of a form of *Rosa stylosa* from Madresfield, near Malvern. It is evergreen, and its fruits ripen in the second year.—Mr. A. W. Bennett read a paper "On the constancy of Insects in their Visits to Flowers." He stated, as a summary, that the different classes of insects show very great difference in this respect. Butterflies show but little constancy, except in a few instances; but they would appear to be guided to a certain extent by a preference for particular colours. The Diptera exhibit greater constancy, though by no means absolute. A much greater degree of constancy is manifested by the Apidæ; and this becomes all but absolute in the hive-bee. It is an interesting circumstance that this constancy appears to increase in proportion to the part performed by the insects in carrying pollen from flower to flower. A much larger number of observations is, however, needed in order to determine with certainty any general law, and especially a careful microscopic examination of the pollen attached to the proboscis, mandibles, legs, and under side of the abdomen and thorax. As respects preference for particular colours, the Lepidoptera paid, while under

observation, 70 visits to red or pink flowers, 5 to blue, 15 to yellow, 5 to white ; the Diptera 9 to red or pink, 8 to yellow, 20 to white ; the Hymenoptera 203 to red or pink, 126 to blue, 11 to yellow, 17 to white.—There followed a communication "On the Methodic Habits of Insects when visiting Flowers," by Mr. R. M. Christy. The author records in detail the movements of 76 insects whilst engaged in visiting 2400 flowers. He tabulates the results, and concludes that insects do possess a decided preference for a number of successive visits to the same species of flowers, although this is not invariably the case. Most of the observations were made on bees, which seem to perform the fertilisation of at least one-half of all the flowers fertilised by insects in this country. Butterflies, as a rule, seem to wander purposelessly in their flight ; nevertheless some species, including the Fritillaries, are fairly methodic. The author believes that it is not by colour alone that insects are guided from one flower to another of the same species, and the sense of smell is suggested. Bees, he avers, have but poor sight for long distances, but good sight for short distances ; of 55 humble bees watched, 26 visited blue flowers ; 12 of the bees were methodic in their visits and 5 not so ; 13 visited white flowers ; 5 were methodic and 8 not at all ; 11 visited yellow flowers, of which 5 were methodic and 6 not ; 28 visited red flowers, 7 were methodic, 9 nearly so, while 12 were not. Mr. Christy inclines to the opinion (though admitting paucity of data) that bees, in a flight from their nest, confine their visits exclusively or principally to one species of plant.

April 5.—Sir John Kirk, Vice-President, in the chair.—Messrs. R. M. Barrington, G. E. Comerford-Casey, F. V. Dickins, and E. Cambridge Phillips were elected Fellows of the Society. — Mr. E. M. Holmes exhibited a specimen of birch-tree sap which had been found to exude from a cut branch one inch in diameter at the rate of four ounces per hour during the night, and seven to eight ounces per hour during the day, before the leaf-buds had expanded ; showing that the rapid rise of the sap was in this case not dependent on transpiration, but probably on endosmose accelerated by the expansion of the wood caused by solar heat. The sap had been collected and analysed by Dr. Attfield, and its contents were recorded in the 'Pharmaceutical Journal' for April 7. — A paper was read, "On *Hemicarex* Benth., and its Allies," by C. B. Clarke, F.R.S., in which he gives a revision of the genera and species of *Kobresia*, *Hemicarex*, *Schœnoxiphium*, and *Uncinia*.

April 19.—Sir John Lubbock, Bart., President, in the chair.—Messrs. T. W. Coffin, F. H. Collins, C. F. DeLaune, D. Morris, J. Jardine Murray, and Hon. J. B. Thurston were elected Fellows of the Society. — Mr. G. F. Angas showed several vegetable products from the Island of Dominica ; among others an unusually large seed-pod of *Cassia Fistula*, and other examples of Leguminosæ ; also Polyporous Fungi from the Roseau Falls.—Mr. F. V. Dickins called attention to a Japanese work issued by the University of Tokio, giving descriptions and illustrations of plants grown in the Botanic Garden of Koishikawa.— There followed a communication

by Prof. P. T. Cleve, of Upsala, "On the Diatoms collected during the Arctic Expedition of Sir George Nares." — A paper was read, "On the joint and separate work of the Authors of Bentham and Hooker's 'Genera Plantarum,'" by George Bentham, F.R.S.

May 3. — Sir John Lubbock, Bart., President in the chair. — Sig. O. Beccari and Dr. J. Lange were elected Foreign Members of the Society. — Colonel R. H. Beddome exhibited specimens of *Asplenium erectum* Sm., showing that nearly all the sori are allantodioid; also specimens of *Diplazium travancoricum*, a new species from the Travancore Mountains. He pointed out that Mr. C. B. Clarke makes a new subgenus, *Pseudallantodia*, founded on the allantodioid character of the sori, but Colonel Beddome's specimens show that this is a character common to the genus *Asplenium* in general. — Mr. J. Eliot Howard exhibited a series of living and dried plants and barks in illustration of his paper. — Mr. Thomas Christy brought forward specimens of Bolivian Cinchonas, and made remarks thereon in connection with Mr. J. E. Howard's paper.—Mr. J. Eliot Howard read a paper, "On *Cinchona Calisaya* var. *Ledgeriana* How., and *C. Ledgeriana* Moens." The author brought forward proofs that the Dutch Government had realised most valuable results from having secured the true *Calisaya Ledgeriana* varieties of *Cinchona*, whereas in India inferior varieties of *Cinchona* had been planted and the stock had greatly deteriorated, and no doubt owing to the best plants having been cut down for the sake of the bark. He brought forward plants obtained from seed which he had received from the Yarrow estate in Ceylon, the bark from these trees having yielded as much as from seven to twelve per cent. of quinine. By the side of this he placed plants that he had raised from the seed given to him by Mr. Thomas Christy, that had come direct from Bolivia, and he drew the following conclusion, viz.:—that he believed that no one has received true seed of the more valuable sorts of *Cinchona Calisaya*, except Mr. Thomas Christy and Mr. Ledger, from South America. —There followed a paper by Mr. W. T. Thiselton Dyer, "On a new species of *Cycas* from Southern India"; the species, *C. Beddomei*, is so distinct that it is difficult to indicate its relationship; but on the whole it might be regarded as a very reduced form of *C. circinalis*, its Malabar congener, though differing from it in many striking particulars.

May 24.—Anniversary Meeting, Sir John Lubbock, Bart., M.P., F.R.S., President, in the chair.—Mr. R. M'Lachlan, on behalf of the Audit Committee, read the Statement of Receipts and Payments for the year, and the Treasurer (Mr. Frank Crisp), followed with a detailed explanation of the various items, showing that the Society was in a very sound financial condition, for besides investments of about £5000, the balance at bankers (30th April) was £514 8*s*. 7*d*. Afterwards the Secretary, Mr. B. D. Jackson, read his Annual Report. Since the last Anniversary 11 Fellows of the Society and 1 Foreign Member had died, and 11 Fellows had withdrawn; while 54 new Fellows had been elected. Between purchase, exchange, and donations 407 volumes and 422 separate

parts had been added to the Library.—Mr. G. J. Romanes, on behalf of the subscribers, formally handed over the portrait of Charles Darwin painted by Mr. J. Collier; its exhibition at the Royal Academy last year having then prevented its presentation. A bust of the late Professor Louis Agassiz, by the American sculptor Mr. Hiram Power, was handed over by Professor Allman to the Society, as a present from the sculptor's son, Mr. H. Power, of Florence. An engraving from Gainsborough's painting of the old English naturalist Mr. Thomas Pennant, was presented by Mr. Howard Saunders, in the name of Mrs. Alston, as a bequest from her son, the Society's late Secretary, Mr. E. R. Alston.—The President then delivered his Anniversary Address, commenting generally on the events of the past year, with special reference to their bearing upon the Society; in congratulating the Society on its annual balance-sheet, he reminded the Fellows that besides investments (*supra*) the property of the Society might be valued at £25,000, or a total of £30,000. He alluded to Colonial Fellows and the good scientific work they are doing, incidentally referring to the British Association Meeting in Canada to take place in 1884. Reference was also made to the progress of rearrangement of the Biological Collections in the new Natural History Museum at South Kensington. This was followed by Reports on the various botanical and zoological publications issued at home and abroad during the last twelvemonth.—The purchase of a portrait of the Oxford botanist, Jacob Bobart (1598–1679) was announced; and the President presented a valuable portrait of Linnæus, from life, by the Swedish artist Magnus Hallman. A resolution was unanimously accorded by the Society, at the instance of the Chair, to to Mr. Bentham and Sir J. D. Hooker, on the completion of their great work the 'Genera Plantarum.'——Obituary notices of some deceased Fellows—Professor Dickie, Dr. Thwaites, Dr. Jameson, Mr. Gibson, and Mr. Moggridge—were read by the Secretary.—The Scrutineers having examined the ballot, then reported that Mr. T. Christy, Mr. H. E. Dresser, Mr. G. R. M. Murray, Mr. H. Saunders, and Mr. H. T. Stainton, had been elected into the Council, in the room of Mr. H. W. Bates, Mr. G. Busk, Mr. C. B. Clarke, Sir John Kirk, and Mr. R. M'Lachlan, who retired; and re-elected for Officers, Sir J. Lubbock as President, Mr. Frank Crisp as Treasurer, and Mr. B. Daydon Jackson and Mr. G. J. Romanes as Secretaries.

June 7.—Sir John Lubbock, Bart., President, in the chair.—Mr. R. J. Clarke and Mr. Frank Matthews were elected Fellows of the Society.—Mr. W. T. T. Dyer exhibited a series of copals, some from Inhambana near Mozambique, the product of *Copaifera Gorskiana*, of various sorts, with a melting-point from 310° to 360° Fahr.; others from Lagos (obtained by Captain Maloney), used by the natives for burning, and powdered by the women as a body perfume. These last are supposed to be from a species of *Daniellia*, the native name being "Ogea."—Mr. Hiern drew attention to specimens of *Quercus Ilex*, var. *Fordii*, from Barnstaple, Devon, showing remarkable alteration in the leaves after pruning.—Mr. G.

Murray exhibited specimens of dace killed by the fungus disease (*Saprolegnia ferax*), the result of inoculation, and said to be the first recorded experimental proof of the communicability of the disease to those fish.—A paper was read by Mr. H. N. Ridley, "On New and Rare Monocotyledonous Plants from Madagascar." The plants described were in part collected by the Rev. W. Deans Cowan in East Central Madagascar, and sent by him to the British Museum; to which were added notes and descriptions of others collected by Hildebrandt and Hilsenberg and Bojer. Among them is a fine new species of *Drimia* (a genus not hitherto recorded from Madagascar) called "Rat-onion" by the natives, who use it to poison rats; and a species of *Xerophyta* closely allied to *X. dasyliri-oides*, but with the leaves thickly covered with spines. Several specimens of *Dioscorea hexagona*, collected by Hilsenberg and Bojer and later by Hildebrandt are worth notice. The species was described by Mr. Baker in Journ. Bot. 1882, p. 270, as a climbing plant with cordate leaves, but these specimens are erect in habit, about a foot high, with narrow, oblong, reticulated leaves, looking quite unlike a *Dioscorea*. In some of the other Dioscoreas, such as *D. pyrenaica*, the young plant is at first erect and then trails along the ground, but is never more than about an inch in the erect growth, whereas *D. hexagona* grows to the height of one foot erect. Among the orchids are two new species of the small-flowered group of *Polystachya*, and two of the typically Madagascar genus *Cynosorchis*, one of which is remarkable for its possessing but one or two very large handsome green, white and purple flowers. Among the *Cyperaceæ*, *Courtoisia cyperoides*, a well-known Indian plant, was collected by Hildebrandt in Madagascar, thus extending its range westward. A new species of *Fintelmannia* was obtained by Mr. Deans Cowan, and there are also specimens from Hilsenberg and Bojer in the British Museum Herbarium. The genus hitherto has only contained a single well-known Brazilian species, which differs very considerably from the Madagascar plant, which has numerous small spikelets, of which far the greater number have only male flowers, the females being usually two or three together in the upper parts of the lowest spikelets; the leaves are setaceous and armed with fine spines. There is also a new genus (*Acriulus*) of the *Sclerieæ*, allied in some respects to *Cryptangium*; of this there are two species; one from Madagascar, where it was collected by Baron and also by Hildebrandt, the other from Angola, collected by Dr. Welwitsch. They are tall marsh plants, with somewhat the habit of a *Cladium* or *Galinia*, with broad leaves edged more or less conspicuously with spines, and a panicle of small purple or green and purple spikelets. The greater number of the flowers are male, the female spikelets are very few and placed in the lower part of the panicle; indeed these have not been seen in the Angolan plant. The stamens are provided with a conical apiculus, crimson in the Angola plant, covered with short processes, which from their shape and position suggest some homology with stigmatic hairs. The style is remarkably cleft almost to the base, where it is dilated, then contracted so as to appear articulated to the next.—Mr. T. H.

Corry read a paper "On the Fertilization of the Asclepiads," chiefly bearing out views already noticed on a former occasion (see Journ. Bot. 1883, p. 94).

BOTANICAL NEWS.

We are glad to notice that the Royal Irish Academy is actively encouraging the further investigation of the botany of Ireland. The following are among the scientific grants recommended by the Council and sanctioned by the Society at its meeting on the 28th of May. £10 to Mr. T. H. Corry, to complete the botanical survey of Ben Bulben; £15 to Mr. S. A. Stewart, for a botanical survey of Lough Allen and the Slievanierin Mountains; £15 to Mr. Greenwood Pim, to investigate the Irish fungi, especially those of Killarney; £10 to Rev. Mr. Lett, for an examination of the mosses and lichens of the Mourne Mountains; £15 to Mr. R. M. Barrington, for the exploration of the flora of the Shannon Lakes.

We regret to learn that the premises of the printers who were engaged upon the plates of Dr. Cooke's 'Illustrations of British Fungi' and 'Freshwater Algæ,' have been entirely destroyed by fire, and with them all the work in progress. This will cause uncertain and unavoidable delay, but as soon as possible arrangements will be made for the continuation of these works.

We are glad to see that the Senate of the University of Cambridge has decided to open the Botanical Gardens on Sunday afternoons during the summer, to members of the University and their friends. It is perhaps not generally known that the opening of Kew Gardens an hour earlier applies to Sundays as well as week-days, so that on Sundays the gardens are now open at 1 p.m. It is hardly likely that many visitors will be present between 1 and 2, but the step is one in the right direction. Now that the Cambridge Botanical Gardens has joined the Royal Gardens at Kew and Hampton Court in Sunday opening, it may be hoped that the authorities of Oxford will not be long behind in granting a similar boon, which we should like to see extended to others besides the members of the University and their friends.

The Hebdomadal Council of Oxford University have resolved, under the provisions of the Universities of Oxford and Cambridge Act, 1877, to suspend further until November 30, 1883, any election to the Sherardian Professorship of Botany.

It is satisfactory to learn that the 'Scottish Naturalist,' to the discontinuance of which we referred at page 187, is to be revived under the editorship of Professor Trail of Aberdeen. The annual subscription is only 4*s*. 6*d*., and it is to be hoped that this revival will meet with the success which it certainly deserves.

Prof. Bureau has been appointed Director of the Jardin des Plantes.

SAMUEL DALE.

(Concluded from p. 197.)

Having discharged his duties as Ray's literary executor, Dale returned to his own work, and in 1705 published a supplement to the 'Pharmacologia,' forming a duodecimo volume almost equal in bulk to the original work. His continued interest in Botany during the few succeeding years is evidenced by his letters to Sloane. In 1706 he writes:—"The death of Mr. Doody hath quite extinguished my hopes of seeing the 'Plantarum Incompletarum Historia,' he was so long about, published, unless his plates and notes fall into some good hand." On September 3rd, 1707, he writes:—"By the coach this day I sent a Hanch of Venison for you and some of my friends to eat together, but directed to your house .... the Persons I desire may be at eating are yourself, Dr. Robinson, Mr. Stonestreet, Mr. Buddle, Dr. Thorp, and Mr. Petiver." From a message sent with the haunch, Dr. Thorp appears to have been comparatively a stranger, as he speaks of him as "the Physitian who assists in the Transactions, whose [name?] at present I cannot remember."

In 1708 he seems to have collected a few choice plants for presentation to Dr. Sloane. They are in vol. 94 of the Sloane Herbarium, and from the labels he appears to have been at Harwich and at Hildersham (Cambridgeshire) during that year. In a letter dated December, 1708, he alludes to having been in London five months previously. From the labels in his herbarium he appears to have collected specimens in the Chelsea Botanick Garden in 1709, and in almost every succeeding year down to 1738, besides receiving many specimens from Rand, who was Præfectus from 1724. In 1709, also, he visited the garden of his friend Eales, at Welwyn, Herts, went to Hampton, and in July paid his only recorded visit to the Oxford Garden, from which Bobart afterwards sent him specimens. In 1710 he seems to have been at Norwich and at Chislehurst, and at the De Beaufort Garden in Chelsea. In the same year he published the second edition of the 'Pharmacologia,' incorporating the Supplement of 1705, but retaining the duodecimo form. In 1711 he visited the garden of Fulham Palace, that of Uvedale at Enfield, that of the Earl of Manchester at Leez, and that of Mr. Jekyll at Hedingham Castle; and during that and the three following years he received many plants, mostly foreign, from Stonestreet. In 1712 he visited Putney, and was again at Enfield; and between 1713 and 1724 he received a large series of plants from Catesby, from Virginia, Carolina, and Jamaica. These exotic forms he seems to have studied as carefully as his British collection, his labels discussing their synonymy in great detail. In 1714 he visited Fairchild's garden at Hoxton, and received specimens from Charles Du Bois of Mitcham; and in 1715 we find he was at Waltham Abbey.

Under date August 14th, 1716, he writes to Petiver:—"I

should be glad to know what success Mr. Sherrard and you had in Suffolk, and whether you found the Loving land Conyza and the Orford Medica. I have been in Kent, and at Dover found the Lychnis and Limonium, but mist the Daucus lucidus." The plants here alluded to are probably *Senecio paludosus*, *Medicago denticulata*, *Silene paradoxa*, *Statice Bahusiensis* (?), and *Daucus gummifer*.

Under date August 20th, 1717, he writes to Sloane (made a Baronet in 1715):—"Sr. At the request of Mr. Innys I am now going to finish the History of English Plants, which I many years ago began, and made a considerable progress in it then, but have long discontinued it by reason of the death of Hen. Faithorn: I am very sensible that the late Mr. Buddle made many discoverys in English Plants not mentioned by Mr. Ray in his last Synopsis, and he being dead his work is not likely to be published: And being acquainted that his copy is in your hands, my humble request to you is that you will please to vouchsafe me the perusal of it, and I do assure you that it shall be safely return'd, and right done to the Author . . . . ."

Two months later he repeats his request in a letter of interest with reference to Buddle, and also as showing the thoroughness of his own work:—"Oct. 30, 1717. . . . . Mr. Buddle had write a Synopsis, Cataloge or some such thing on English plants which he did one time show me, and told me he intended to publish it, and had gone so far as to draw the Dedication and Preface, but that which hindered him in his design was this: Having either in Dedication or Preface said that the method was with the approbation of Mr. Stonestreet and others, but they not approveing of it made him decline it: This latter part I had from Mr. Stonestreet more than once; and the same if I mistake not from Mr. Rand: Now having been told that you had purchased not only his plates but likewise this copy, made me write to you to desire the perusal of it . . . . . and was the more surprised when I understood you had it not, because I could not conjecture what had become of it, nor how you came to miss of it. I thank you for the kind offer you made of a sight of his plants at your house, but this must needs be impracticall as to me, for being in business, my time will not permit my being so long in London, as the taking out of notes, and descriptions will require besides, it will be needfull for me to compare my own dryed plants with yours, and to have my own copy at hand that so I might not thro' mistake impose upon the world, and the design be perverted by leading into errors insted of correcting them: and this I am not without hopes may in some measure be prevented (for humanum est errare) if you will please to permit the volums of English plants to be sent to Braintree, which they may be without prejudice, by being put in a wooden case made to them; if you please to grant this favour Mr. Innys hath order to have such a case made, and you may assure yourself they shall be carefully used and return'd faithfully." It does not appear, however, whether this suggestion was ever acted upon. The Mr. Innys mentioned was his publisher, and Henry Faithorne had been printer to the Royal Society.

During the next twelve years we know but little of Dale's life and work. In 1721 he was at Ramsgate, and received plants from Uvedale; and in the following year he visited Cambridge and Eltham. He was also at Sherard's garden, at the latter place, in 1724, '25, '26, and '31. In 1723 and '24 he received specimens from Andrews, of Sudbury, with whom he seems to have been on intimate terms, their practices being within riding distance, and whom he visited in 1725.

In 1725, also, he received a fascicle of plants from Mr. Matthews, Deputy-Governor of St. Kitt's; in 1726 some specimens from Dillenius, then at Eltham; and in 1727 "plantæ Indiæ Orientalis collectæ a Francisco Dale." This Francis Dale, spoken of as "cognatus," "consanguineus," and as "Junior," was, I believe, either a nephew or a first cousin once removed, being the son of Francis Dale, practising at Hoxton, who seems to have been either an elder brother or a cousin. Francis Dale, junior, seems to have travelled both in the East and West Indies, and in 1730 sent his relative a large number of specimens from New Providence, and, in 1732, from Bahama, with seeds, some of which were raised in the Braintree garden.

In 1730 Dale published the second great work of his life, 'The History and Antiquities of Harwich and Dovercourt, in the County of Essex,' by Silas Taylor, Gent.; to which is added a large Appendix, containing the Natural History of the Sea-coast and Country about Harwich, particularly the Cliff, the Fossils, Plants, Trees, Birds, and Fishes, &c., by Samuel Dale;' 4to. It is dedicated to Sir Hans Sloane, "In grateful acknowledgment of his many favours." Of Dale's share in this book, Pulteney, who styles it "a real acquisition to science," says that in the "large notes, amounting to much the greater part of the book. Howsoever respectable our author may appear as an antiquary . . . . he is equally so as a naturalist." In the preface Dale says that "dwelling more than 30 miles from the place, and being continually employed in his Profession," he "could not afford more time than perhaps one day or two in a year, and that in the summer months." He dwells at length upon the cliff, "whose imbedded Fossils," he says, "I had there discovered; the first Invention of which the late Dr. Woodward in publick company attributed to me." He describes cement-stones, "copperas stones," *i.e.* pyritous nodules, used in manufactures in the neighbourhood, amber, "selenites," "a congeries of Vermiculi," a "Patella," 20 "Cochleata," or univalves, 18 bivalves, "Odontopetra," or shark's-teeth, and a vertebrate "ileum;" and gives a plate representing the Crag resting upon the London Clay, and forming an overhanging cliff. In the Appendix he enumerates twelve Crustacea, sixty fishes, forty-seven birds—chiefly sea-fowl, six "marine insects," thirty-six Testacea, and ninety-four of the less common plants; so that, whilst the original manuscript of the work was that of an ordinary local history, it became in his hands a record also of the natural productions of the neighbourhood, such as is seldom produced even in our own day. It reached a second edition in 1732.

In 1731, besides visiting Eltham and the Chelsea Garden, we learn from his herbarium that he visited those of Sir Charles Wager and Mr. Grey at Fulham, and made a summer tour into the West of England. He visited Mr. Blaitwaite's garden at Dereham, Gloucestershire; was at Keynsham, between Bath and Bristol, on May 21st; went to Bristol, Bath, Wells and Glastonbury, and thence apparently into Dorsetshire, being at Wimborne in June, and also at Wareham and Poole. This year is also the first in which I have any note of his receiving plants from Peter Collison, of Peckham, whom he visited in 1732. In this last year he was at Mr. Greene's garden at Fulham, and again at Sir Charles Wager's at the same place, and also at Andrews' at Sudbury; as also in 1733 and 1734. In 1734 he visited the Gog-and-magog Hills, and Dr. John Spurgeon's garden at Halsted; and in 1736 "the noble Lord Peter's garden," probably that at Thorndon Hall, Essex.

Dale's last contribution to the 'Philosophical Transactions' belongs to the close of the year 1736, and accompanied a present of a pair of antlers of the Moose deer to Sir Hans Sloane. It is entitled, "Descriptions of the Moose deer of New England, and a sort of stag in Virginia; with some remarks relating to Mr. Ray's description of the flying squirrel of America" (Phil. Trans., vol. xxxix., p. 384). To this year also belong the earliest of his letters to the "Rev. Mr. (afterwards Dr.) Thos. Birch in St. John's Lane, near Hickes-Hall" (Sloane MSS., 4304). These refer mainly to the third edition of the 'Pharmacologia,' which Dr. Birch apparently translated into Latin. Dale speaks of himself as "I who have been more than 60 years from school," and elsewhere says, "I find a note or two wanting which I dare not trust my own Latin with, but hope your goodness will excuse my troubling you with the request of doing it for me." Few of the naturalists of the time could approach Ray in his graceful style of classical composition, and it is possible that Dr. Tancred Robinson may have previously assisted Dale in these matters as he assisted Petiver. In this series of thirty-nine letters Dale speaks of "my kind friend Mr. Mark Catesby," and "my respected friend Mr. Isaac Rand," and also alludes to the death of the two sons of his "nephew Dr. Thos. Dale," who was resident in South Carolina.

The third edition of the 'Pharmacologia' was published between May 11th and August 11th, 1737, in quarto. The title is the same as that of the previous editions, with addition of the letters "M.L." to the author's name, and at its close the words, "Ad calcem adjicitur Index duplex: Generalis alter, nominum, &c., alter Anglico-Latinus; in gratiam Tyronum, Tertia editio, multis emendatis et aucta." As a frontispiece there is a fine portrait of the author, lettered "Geo. Vertue sculpsit 1737," similar to the one prefixed to the present memoir, but surrounded by a frame inscribed, "ætatis suæ 78." The letters "M.L." no doubt signify Licentiate in Medicine; but I have as yet been unable to discover from what body Dale received such a diploma. Of this work Pulteney justly remarks, that "In an interval of more than forty years, between the first and last editions . . . . . several excellent

publications had taken place abroad, which, aided by the improvement at home, enabled Dale to select better materials, and give his last edition the importance of a new work. Scarcely in any author is there a more copious collection of synonyms." It is perhaps necessary to explain that this edition was followed by several others after the death of the author.

In the preface is a passage of such interest, in connection with the herborizations of the Society of Apothecaries, that I may perhaps be justified in quoting it at length :—" Ut stirpes in agris nascentes melius ediscant Pharmacopæi Juniores, sex per æstatem Plantas investigandi gratia instituit eadem Societas itinera (mense Julii excepta) quibus confectis, herbarum nomina inter Tyrones quisque indicat; et qui per æstivum tempus maxime omnium profecerit (Judicio Præfecti, &c.) Raii Synopsin stirpium Britannicarum Pergamena viridi compactam, Laborum accipit mercedem. At Grande Iter eadem causa Mense Julii susceptum, nequaquam est silendum; quod quidem institutum centum abhinc annos invaluisse videtur. Clarissimus enim Thomas Johnsonus in Itinere plantarum suo investigationis ergo suscepti à decem sociis in agrum Cantianum, Anno Domini 1629 hæc habet: Paucis abhinc elapsis annis consuetudo vere laudabilis inter rei herbariæ studiosos crevit, bis aut sæpius quotannis triduum aut quatriduum iter Plantarum investigationis ergo suscipere. Quorum quatuor Itinera Annis 1629, 1632, 1634 & 1641 ipse edidit. Vetus hic Mos jam desiit observari in modum supra dictum; sed nunc horti Præfectus mense Julii, cum quinque vel sex sociis rei Botanicæ peritis, in Cantium aut alium quemlibet locum per dies duos vel tres iter faciunt; & quas collegerint Plantas ad congressum generalem societatis supra dictum afferunt, ubi Præfectus in præsentia Magistri, Gardianorum, &c., eas demonstrat, ad cujus Prælectionem cuilibet curioso datur Accessus."

Dale's appreciation of the work of Johnson is further exhibited by the fact that in his copy of the 'Thermæ Bathonicæ' (1634) and 'Mercurii Botanici pars altera' (1641), now in the Banksian library, he has transcribed in his own neat handwriting the whole of Johnson's other minor works, viz. the two Kent tours of 1629 and 1632, the two Hampstead lists of the same dates, and 'Mercurius Botanicus' of 1634.

The last letter to Dr. Birch is dated August, 1738; but beyond this, and the fact that he collected specimens in the Chelsea Garden during that year, we know nothing as to the last few months of Dale's life. He died on the 6th of June, 1739, being then about eighty years of age, and was buried in the Dissenter's Burial-ground at Bocking.

In the 'Gentleman's Magazine' he is described at his death as Dr. Samuel Dale, F.R.S.; and many notices of him speak of his being a Licentiate of the Royal College of Physicians. He, however, seems never to have received or used the title of M.D.; his name does not occur in Dr. Thomson's list of the Fellows of the Royal Society, nor in that by Dr. Munk of the Licentiates of the College of Physicians. There is, in fact, no reason to suppose that either of these three titles have been rightly applied to him.

His learning received recognition during his lifetime from Linnæus, whom he may possibly have seen during his visit to England in 1736, in the dedication to him of the genus *Dalea*. This was founded in the 'Hortus Cliffortianus' (1737) for a South American papilionaceous plant, communicated to the Cliffort garden by Philip Miller, of Chelsea. In the 'Species Plantarum' (1753) Linnæus included this species in Van Royen's genus *Psoralea*, as *P. Dalea;* but Jussieu and Willdenow restored the genus, which includes several species both from North and South America. Another genus *Dalea* was established by Browne shortly afterwards for a Jamaica species, *Eupatorium Dalea* L.

In Eloy's 'Dictionnaire Historique de la Medecine' (1778) the author of the 'Pharmacologia' is made a distinct person from the editor of the 'History of Harwich.' This is copied in Adelung's 'Jöchers Gelehrten Lexicon' (1787). Hoefer's 'Nouvelle Biographie Générale' (1856) gives the date of his birth erroneously as 1650, but makes the further statement:—"On lui doit l'introduction en Europe de plusieurs végétaux exotiques, dont la plupart lui avaient été addressés de la Caroline par Catesby." This is very probably true. Perhaps the best account of him is that in Rose's 'Biographical Dictionary,' vol. vii., 1857.

In the Sloane MSS. there is the following "copy of that clause in the late Mr. Dale's will which relates to his Legacy of Books left to the Worshipful Company of Apothecaries London. Also I give and devise unto the Master Wardens and Society of Apothecaries of the City of London all such of my Books in Botany as at present they have not and also all my Hortus Siccus or collection of dried plants including those collected by my kind friend and neighbour the late learned Mr. John Ray upon condition the said Master Wardens &c. shall within twelve months next after my Decease make or erect proper conveniences in their Physick Garden at Chelsea in the County of Middlesex for the Reception thereof and under such Regulations for the keeping and preserving them as shall be agreed on and approved of by Sr. Hans Sloane Bart. M.D. President of the Royal Society London and my Executor hereafter named."

Among the books thus bequeathed is a presentation copy of the second edition of Ray's Synopsis, to which are added two manuscript appendices enumerating some forty additional species, mainly from Essex, in Dale's handwriting.

It is difficult to put in words the grounds for one's opinion as to the merit of a botanist who was mainly a collector. Much may be merely fancy; but when we find critical forms of *Mentha*, *Atriplex*, *Artemisia*, *Statice* and *Arctium* separated, though in many cases not named, we shall probably not be wrong in classing Dale with his friend Buddle as one of the first critical students of our British Flora. As a specimen of his work I will quote the label of the specimen of *Orchis militaris* in his herbarium, the only record that I know of its occurrence in Essex:—

"Orchis Strateumatica *Ger.* 165. *Emac.* 215. *Ray Hist.* II. 1213. Orchis strateumatica J. B. major *J. B.* II. 758. *Hist. Oxon.*

III. 494. Orchis militaris major *Tourn. Inst.* 432. Cynosorchis militaris major *C. B. Pin.* 81. Cynosorchis militaris seu Strateumatica major *Park. Theat.* 1344.

"This I take to be the plant which was on the 13th of May 1738 shewen me by Mr. Jos. Andrews in Walter Belchamp Parish Essex on a little Hillock in the corner of a ploughed field adjoyning to the way leading from Goldingham-Hall by the Lime-kiln towards Gastingthorpe.

"At which place likewise grew the Orchis Anthropophora oreades fœmina.

"The stalk above ground was about one foot, the truss of flowers moderately large but not very long it not being all blown out, but consisting of about 20 flowers, the lable resembles that figured by Dr. Dillen. Tab. 19, f. 2. Ray Synop. III. 379. only the armes or side-segments are narrower and the body longer. The armes thighs and spur behind are purple the body slender and paler, but springled with deeper spots. The Hood is large projecting forward, consisting of 3 pale leaves or segments edged & striped faintly with a deeper colour above but spotted as the body underneath."

So carefully drawn up are the tickets, of which this is a specimen, that they not only far surpass those of any of his predecessors, but also may possibly have been those "Elucubrationes Botanicæ" alluded to in the preface to the first edition of the 'Pharmacologia,' and have been destined for incorporation in the 'History of English Plants,' the manuscript of which is not known to exist.

A somewhat dingy oil-painting of the botanist is preserved at Apothecaries' Hall; but, though his reputation has become similarly dim in the lapse of time, I trust that my researches, in which I have received great assistance from many friends, but especially from the officers of the British Museum, may have shown that there yet remains much of value in the life and writings of Samuel Dale.

G. S. Boulger.

ORCHIDACEAS QUATTUOR NOVAS SINENSES

PROPONIT H. F. Hance, Ph.D., Soc. Zool.-Bot. Vindob. Soc., cet.

1639 1. **Liparis** (Cestichis) **chloroxantha,** sp. nov.—8-pollicaris, radicibus dense pilosis, pseudobulbis ovoideis teretibus glaberrimis 9 lin. longis, foliis 4 inferioribus abbreviatis vaginantibus 2 superioribus lineari-lanceolatis acuminatis 6 poll. longis 9 lin. latis 5 nerviis nervo medio subtus prominulo 2 interioribus minus 2 exterioribus vix omnino conspicuis, scapo valde compresso ancipite, bracteis bifariis lineari-subulatis acutissimis inferioribus ad 8 poll. longis floralibus 3-linealibus, racemo 15–20 floro 4 poll. longo, floribus 4 lin. longis adhuc clausis viridibus expansis luteolis, sepalis lateralibus oblongis obtusis recurvis dorsali filiformi patente, petalis filiformibus patentibus, labello late depresso-orbiculato arcte revoluto basi bituberculato margine superiore

denticulato ipso apice ex emarginatura dense obtuso terminato, columnæ margine edentato.

In rupibus montis Parker, ins. Hongkong, necnon in terra continenti chinensi, m. Martio 1881, coll. cl. C. Ford (Herb. propr. n. 22170).

Huic proximam credo *L. crenulatam* Lindl., ex insula Java.

2. **Bolbophyllum** (Brachyantha) **tigridum,** sp. nov. — Rhizomate crasso, pseudobulbis ovoideis, foliis solitariis oblongis margine (in sicco saltem) revolutis apice integerrimis striato-nervosis subtus pallidioribus pollicaribus 3 lin. latis, scapis filiformibus erectis folium duplo superantibus, bracteis membranaceis persistentibus caulinis paucis remotis vaginantibus acutis floralibus linearibus acuminatis lineam longis, floribus umbellatim 5–8 —corymbosis pedunculis tenuissimis 3-linealibus fultis, sepalo dorsali ovato obtuso purpurascente nervis 3 saturatioribus percurso 1½ lin. longo lateralibus lineari-subfalcatis aurantiacis acutiusculis 3 nerviis 5 lin. longis, petalis falcato-oblongis sepalo dorsali paulo minoribus ac ei concoloribus, labello parvo complicato apice lamella quadrata membranacea cornibusque duobus lateralibus aucto.

In jugo Lo-fau-shan, seu montium tigridum, prov. Cantonensis, d. 22 Sept. 1882, leg. rev. E. Faber (Herb. propr. n. 22164).

B. umbellato, Lindl., ut videtur, proximum. Hæc et affiniores species transitum in *Cirrhopetalum* tam lenem efficiunt, ut lubentius, duce Reichenbachio, sic dicta genera conjungerem, venerabili Benthamio nuperrime tamen recusante.*

3. **Eria** (Dendrolirium) **ambrosia,** sp. nov. — Rhizomate crasso, pseudobulbis botuliformibus leviter rugulosis 16 lin. longis, foliis solitariis crasse coriaceis oblongis basi angustatis apice retusis supra lucidis secus medium leviter canaliculatis subtus pallidioribus opacis 2 poll. longis 8 lin. latis, scapo radicali tenui erecto glaberrimo bipollicari unifloro bracteis circ. 4 membranaceis scariosis vaginantibus acutis 3 lin. longis prædito, flore cernuo glaberrimo (explanato labello) pollicari, sepalis extus albidis intus purpureo-nervosis dorsali fornicato ovato acuto 5 lin. longo lateralibus columnæ adnatis obliquis bilobis lobo postico acuto antico rotundato, petalis planis ovato-lanceolatis roseis 4 lin. longis, labello albido-roseo columnæ arcte adpresso secus medium bicristato lateribus erectis apice in cornu breve rugosum obtusum decurvum producto.

In rupibus summi montis Victoria Peak, ins. Hongkong, m. Martio 1875 florentem, detexit cl. C. Ford (Herb. propr. n. 22156).

Species satis pulchra, et, ut videtur, bene distincta, floribus suavem odorem, oleo amygdalarum amararum essentiali similem, spirantibus. Sectionem intellego qualem a Benthamio recens definita est.†

4. **Cystorchis ? nebularum.** sp. nov. — Caulescens, caule foliisque glaberrimis, his circ. 7 confertiusculis 5-7 pollicaribus ovato-lanceolatis acutis plurinerviis 1–2¼ poll. longis in petiolum

* Journ. Linn. Soc. xviii. 299.
† Op. supra cit. 303.

semipollicarem vaginantem sensim angustatis, spica densiuscula secunda 4–8 flora paulo ultra folia emersa cum bracteis linearilanceolatis acuminatis flores æquantibus glanduloso-tomentosa, floribus 7-lin. longis, sepalo dorsali cum petalis penitus conferruminato rhomboideo lateralibus oblique ovato-lanceolatis acutis uninerviis labello basi scrotiformi (scroto intus pilis crassis glandulosis obsito) columnæ basi adnato vesiculis callisque carente apice obtuse acuminato, anthera ovoidea acutiuscula, rostello in processus filiformes duos lineam longos apice breviter triangulato-incrassatos producto.

In summis montibus Lo-fau-shan, prov. Cantonensis, abeunte Septembri 1882, coll. rev. E. Faber (Herb. propr. n. 22147).

Planta habitu *Goodyeram* omnino referens, sed characteribus potius *Cystorchidi*,—mihi tantum e lauto Blumei opere notæ,*—congruens, etsi a paucis descriptis speciebus plane diversa.

TWO RECENT ADDITIONS TO THE BRITISH MOSSES.

By H. Boswell.

Bryum gemmiparum Notaris. — Three or four weeks ago I received from the Rev. Augustin Ley some specimens of a *Bryum* which he had just found on the banks, or rather in the bed, of the Usk in Breconshire, and a great puzzle it proved. The first aspect was somewhat that of *B. Schleicheri* or *latifolium* in a dwarfish state, but the form and structure of the leaf were quite different when brought under the microscope. Large forms of *Webera albicans β. glacialis* (*Br. glaciale* Schleich.) are said to bear a resemblance to *B. Schleicheri*; but with the best endeavours to make them agree it was evident that there was a great discrepancy between the descriptions of *B. glaciale* and the moss in hand; moreover it did not resemble *albicans* at all. The leaves were in outline and structure a good deal like those of *B. Muhlenbeckii*, but the habit and aspect of the plant as well as the place of growth were very different, and as the details accorded with no other known British species it became necessary to seek farther. Eventually I found it to be identical with *B. gemmiparum* Not., a quite unexpected and very interesting addition to our flora, as it is hitherto only recorded for the extreme south of Europe—Provence, Italy, Sardinia, and the Attic mountains. As yet no fruit has been found, and it is to be feared that it will prove to be one more of those mosses which remain "in Britannia sterilis," fruiting only in warmer latitudes.

Sphagnum Torreyanum Sulliv. — Another moss of considerable interest, new not only to Britain but to Europe, was found by Mr. Ley and myself during a ramble in North Shropshire last summer, growing in pits of deep water in bogs near Whitchurch. This is the *Sphagnum Torreyanum* of Sullivant's 'Icones,' reduced

* Fl. Jav. Orchid. 75 tt. 24, 37.

by later writers, including Dr. Braithwaite, to the rank of a variety of *S. cuspidatum*, which is no doubt its proper position. It is larger and more robust than any of the other forms of that variable species, with stout erect stems standing well up out of the water, and students of the tribe may expect to meet with it in similar situations; for on sending a specimen to Mr. Whitehead he at once identified it with others which he had gathered before on Risley Moss, near Warrington, but had not determined. These, however, are a trifle less robust, and might easily be passed as merely large *plumosum*. The Shropshire specimens are identical with those I have from N. America, where alone this *Sphagnum* had hitherto been found.

Another of Sullivant's figures represents a very similar plant, from California, called *Sph. Mendocinum;* this is treated by Dr. Braithwaite as identical with the above, while Messrs. Rau & Harvey in their Catalogue assign it the position of a distinct species. I have not seen this, and so have no opinion to give; the figure shows little difference.

ON *ALLIOSPORA*, A SUPPOSED NEW GENUS OF *DEMATIEI*.

By Greenwood Pim, M.A., F.L.S.

Early in 1882 I observed a curious black mould on a decaying Sapuçaya-nut kernel. To the naked eye it presented a velvety appearance, intensely brown-black in colour, and resembling a small dark *Aspergillus*. Under the microscope, however, the necklaces of spores, instead of being attached spore to spore, arose from delicate threads, somewhat like *Haplaria*. I showed a specimen at a meeting of the Dublin Microscopical Club, in whose Proceedings a note of it appears, under the title of *Alliospora Sapucayæ*, the name *Alliospora* being in allusion to the arrangement of the spores resembling hanks of onions. A young crop shortly appeared on the nut, which was placed in a damp atmosphere. These resembled *Aspergillus* in every respect, and showed no appearance of the before-mentioned threads. Owing to circumstances I was unable to pursue the development of this curious plant, and it was only a few weeks since that I was able to further examine the specimens in my cabinet. I then found that what I had taken for the simple globose head of an *Aspergillus* was of more complex structure than I at first imagined. On the top of a long slender hypha, with very strongly thickened walls, is seated a small globose columella, areolate on the surface; from this arise a great number of very much elongated basal cells, which by mutual pressure form a solid layer outside the columella, and nearly twice its diameter in thickness. From the ends of these basidia, if I may so call them, arise the sporiferous threads, which appear to be in general simple and septate till just

at the extremity, where four or five short branches form a little umbel. The tips of these branches produce spores by division, as in *Penicillium*.

Such a structure will not, I think, come under any of the existing genera of *Hyphomycetes;* hence I venture to propose a new one as follows :—

Alliospora, nov. gen.—Flocci erect, bearing a globose head from which depend delicate hyphæ clustered with spores.

A. Sapucayæ. — Forming a dense velvety black-brown felt; central columella areolate; basidial cells elongated and densely packed, forming a thick outer coat. Sporiferous threads septate, verticillate at the extremity, with ultimate ramuli breaking up into spores; spores clustered on threads as well, resembling hanks of onions, globose, ·0002 inch; purple-brown. On decaying Sapucaya nut, Jan., 1282.

ARUM MACULATUM AND ITS CROSS-FERTILIZATION.

By Robert Miller Christy and Henry Corder.

Most of the following observations have been made by both of us in common, but our respective names are attached to any special one which seemed to require it. We are aware that many of our observations are not new, although we believe that some of them are so. In any case so few persons seem to be aware of the interesting peculiarities connected with this plant that we make no excuse for describing them in detail.

Laying up during the summer a large stock of nutritious matter in its great tuberous corm, the *Arum* forms underground during the autumn its next year's leaves and spathe, and is thus ready to appear above ground as soon as the frosts of winter have taken their departure. So early indeed does it make its appearance, that we believe we are correct in saying that, if not quite, it is very nearly the first plant which puts its leaves above ground in the spring time. Dr. Bromfield states that he has "even remarked them springing up at the close of autumn at Bonchurch." During a mild winter they may often be seen in the month of January, or even earlier.* These leaves have a very rapid growth, and the three or four which each plant bears reach their full size about the beginning or middle of April, according to the season. The petioles are whitish, with a delicate tinge of pink at the bottom, and are enclosed in a sheath of four parts, which are in pairs, opposed to

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* Thus we found plenty appearing above ground on the 26th of December, 1881, at Chelmsford, and at Saffron Walden on the 1st of January following; and at the latter place on December 30th, 1882, many were already two inches above ground. After a severe winter, however, they do not appear so early. On the 22nd of February, 1880, many were about five inches high; and on the 13th of the same month in the following year, after a hard and late winter, some at Bardfield were only about two inches high, though others at Walden on the 28th were six inches.

one another, and all of a greenish colour bluntly pointed. The tips of one pair sometimes appear a little above the ground, while the other two are generally an inch or so below. The leaves are smooth and shining, of a dark green colour, and always more or less arrow-shaped; but they are subject to a great deal of variation in this particular. The younger the plant the more oval the leaf, and only the older plants exhibit the truly hastate pattern. On their first appearance the young leaves are of a yellowish colour, but they very quickly open and acquire their proper tint. The spots on its leaves, from which the species takes its name, are also extremely variable--indeed by far the larger number of the plants one meets with do not exhibit the slightest trace of spotting; but in the Isle of Wight, Dr. Bromfield says, "The varieties with spotted and plain leaves are almost equally common, and grow intermixed." Reichenbach seems to have considered the spotted and plain leaves as proving the existence of two species, but this character is of no specific value whatever.

We have not been able to observe any particular conditions under which the plants usually produce either spotted or plain leaves, and do not at all know to what to attribute the difference. In the neighbourhood of Saffron Walden Mr. Christy has observed that the two forms do not generally grow intermixed, although they occasionally do so; and he can remember once finding a single plant with large dark spots growing among a great number of unspotted ones. He has further observed that the plants growing together in one spot often bear a greater or less resemblance to one another in the *manner* of their spotting, for there is as great variety in the nature and appearance of the spots as in their number and intensity. We have sometimes thought that the spotted leaves are rather later in appearing than the plain ones, but this may not be so. Spots certainly are not in any way a mark of the age of the plant. Dr. Bromfield writes, "In this island I can perceive no difference in the time of flowering, and the leaves of both are alike variable in size and shape. The spotted form would appear to be rarer towards the north, where, as in Sweden and Denmark, this variety is an entire stranger." It seems then almost impossible to draw any conclusions from the presence or absence of the spots. Sometimes the spots are small and specky, at others medium-sized or blotchy, even up to one inch in length, and not unfrequently they are arrow-shaped. At times they are of a very dark colour, at others dull, as if half washed out. They are always darkest on the upper surface of the leaf, and generally faint on the under. Very often the part which they cover is more or less sharply concave above and convex below; and on rare occasions we have seen such plants in which this peculiarity has been carried to an extreme, the leaves having borne many dark-coloured medium-sized roundish spots, and being so indented on the top and bulged out below where the spots were that they suggested the idea of their having been struck by a charge of large shot possessing sufficient force to cause a deep indent but not to go right through. In many cases these hollows were more than half as deep as they were broad. In such speci-

mens, as also occasionally in less spotted ones, the spots are often faintly developed on the leaf-stem, and the wing or ribbon which it bears, but never on the sheath; and it is observable that the spots which appear on their spathes are always bulged *inwards;* so that if a spathe may be regarded as a modified leaf, it may further be regarded as one rolled backwards. We have generally noticed these very darkly marked specimens, which are often very handsome objects, growing in woods, but, as a rule, we believe that they are generally unspotted in such situations. We have not unfrequently observed unspotted leaves to be faintly marked along the veins with a pale milky white colour.

Although the growth of the leaves is so rapid, that of the spathe is extremely slow, and the former have often arrived at maturity before the latter has grown itself free of the wing of the inner leaf which wraps it round. Nevertheless the spathe and all its contents are fully formed long before the leaves appear above the surface of the ground, and may easily be found by digging up an entire plant during the winter, when it will be discovered as a small tightly rolled-up spike about one inch in length, situated slightly above the root and in the centre of the stem; but, if opened, the floral organs will be found to be fully formed, although of course very small. At this period all is of a yellow colour, like the leaves on their first appearance, except the spot and the anthers, which latter are generally of a bright orange. Gradually the whole flower grows and elongates, until the tip of the spathe emerges from between the tops of two side wings of the inner leaf-stem. A long while then elapses before the whole spathe appears, but by the time it is quite free it is almost of its full size, though still tightly rolled up; and although the sunlight has never reached the spadix or anthers, these are already of their proper colour. The stalk continues to grow until it reaches a length of about two inches, and the tip of the spathe is rather higher than the leaves. At this stage a halt is made for some days, and although apparently quite fully formed and ready to open, it does not do so. As showing the slowness of development of the spathe, we may remark that one Mr. Christy observed on January 15th, 1882, with its tip $1\frac{1}{2}$ inches above ground, did not open until April 6th. The date of the first opening of the spathes, like that of the first appearance of the leaves, seems to vary much according to the season. Thus in 1880 and 1881 Mr. Christy found them first on May 5th and 8th respectively, but on the 6th of April in 1882, and about the 23rd in 1883, after mild winters. In about a month from the appearance of the first ones there are very few to be found out unwithered. Six inches would perhaps be about the average total length of a spathe, but we have on some occasions seen much larger ones; one, for instance, $9\frac{3}{4}$ in. long and $3\frac{3}{4}$ in. broad, while two others we have measured 10 and 11 in. long. It is a curious fact that the spathes are rolled up indifferently either way—either dextrally or sinistrally—in about equal numbers.

The long period of quiescence preceding the opening of the spathe is followed by a short one of great activity and interest;

but, before describing this, we wish to speak as briefly as possible of the strange-looking flower which has unrolled itself suddenly before us in the course of an hour or two, presenting us with the well-known hood, with its sides wide apart, disclosing between them the brightly-coloured spadix, and tapering elegantly to a sharp point at the tip, which hangs slightly over forwards. The more essential floral organs are concealed within the lower part of the spathe, which never opens, and which for convenience we will term the "bulb." The spathe itself is nearly always of a pale green, but, like the leaves, it is often spotted, and a spotted spathe almost invariably accompanies a spotted leaf. As a rule, there are fewer spots on the former than on the latter, although the spots on the spathe partake generally of a good deal of the nature of those on the leaves, and on both they may be discovered as small purple specks in their very earliest stages, long before they appear above ground. The spathes are often very handsome objects, and exhibit colouring which the leaves never possess. Thus the tip is generally shaded with a strong vinous tinge; the inside of the bulb, especially round the neck, is often of a fine reddish purple, and the extreme edge is nearly always coloured, even in specimens otherwise plain. The most beautiful form we have yet seen is an unspotted one deeply shaded with claret, as if it had been dipped in colour and hung upside down to dry—the colour being most intense at the tip, the lower part being pale yellowish green. The shape of the spathe is subject to a good deal of variation. Those growing in hedgerows and other rather dry situations are generally small, short, and rounded, whilst those growing in moister and more luxurious spots, such as woods, are larger, longer, and more tapering towards the point. It seems to be a matter of no importance to the plant whether the opening of the spathe faces the light or not, and those growing on a bank often face directly towards it.

The reproductive organs of the plant are arranged round a central column in the bottom of the bulb, and are of a peculiar nature. The ovaries, generally thirty to forty in number, are lowermost, and as a rule they are white, but sometimes are purple at their tips, which are furnished with a small tuft or brush of stigmatic bristles to catch the pollen. A few of the upper ovaries are modified and converted into short hairs. Shortly above these come the anthers, which are sessile, forty or fifty in number, and often of a fine purplish red, though sometimes muddy yellow. Above these again, after another short interval, come a number of fine, slender, tapering filaments from $\frac{1}{8}$ to $\frac{1}{4}$ in. long, white at the base, but often tipped with purple, extending outwards and slightly downwards, and situated in the narrowest part of the neck of the bulb, which they almost fill. Above these rises an upright straight cylindrical column, which shortly enlarges and forms the curious elongated club-shaped spadix. This is hard and brittle, and is generally of a fine bright purplish red, but it varies to pale muddy yellow. It usually partakes of the same colour as the anthers, and those flowers which have it most

intensely coloured generally have the inside of the bulb of the same tint; but we have not been able to observe that the colour of the spadix has any connection with the amount of spotting on the leaves or with any other peculiarity of the plant.

During the period in which the mature spathe remains unopened it is often subjected to the attacks of some animal—presumably a rabbit. We have repeatedly observed this in more than one locality, and especially in woods; the number of flowers destroyed by this means must be considerable. We have never known the leaves to be eaten, and as the tip or side of the spathe is rubbed off and nothing but the spadix is taken, it is evident that the extraction of this is the real object of the animal. That this should be eaten seems rather peculiar, for to us it is poisonous; and a very small piece, if placed in the mouth, produces most unpleasant effects, being so pungent that it causes the lips and tongue to sting sharply for some time after—often an hour or more.

As to the time of day when the spathes open, there seems to be some doubt. Very fresh-looking ones may often be seen in the early morning, and indeed at all times of the day; but Mr. Corder is convinced that the majority open in the evening about 5 or 6 o'clock. This is certainly true of a number which we have observed growing, and of others which we have gathered and kept in water; but it is quite certain that all do not open at this time, and it is even probable that some open during the night.

Immediately following upon the unrolling of the spathe some of the most curious circumstances take place which occur in connection with any plant in this country. The spadix at once begins to emit a strong smell, which to the senses of some people (Mr. Corder among them) presents itself as rather sweet and sickly, though not particularly objectionable; but to the majority of persons it is a disgusting stench when smelt close at hand. Fortunately it is not of power sufficient to spread itself on the air, but two or three spathes are enough to make a good-sized room smell very disagreeably. The spathes seem to open and emit their scent as well in plucked flowers as in growing ones, and some have continued to smell in water until at least 10 o'clock at night.

There is another peculiar phenomenon which is pretty much contemporaneous and co-existent with the smelling, namely, the emission of heat from the spadix,* which even makes the whole

* To what temperature above that of the atmosphere the club of the spadix may be raised by this natural heat we are unable to say, on account of our not having used a thermometer suited to the purpose. The following figures were taken by cutting a portion out of the side of the club, and pressing into it the bulb of a small common thermometer (F.); but it is obvious that to obtain the correct temperature an instrument should be used small enough to be inserted into the centre of the club, as the evaporation from a wound is likely to lower previously existing temperature. The scent is certainly sometimes given out after the spadix has cooled. For instance, one spathe was fully opened, smelling a little and slightly warm at 9 p.m. on April 6th, 1882; early in the morning of the next day the heat was gone, but the smell continued, and a trace of it even remained until the following day, when the pollen was being shed. In most spathes the smell does not last so long as this, but as the plant was growing indoors it probably continued to smell longer through want of fertilization.

lower part of the spathe perceptibly warm, so that on thrusting the bulb of a small thermometer down into it the mercury is raised five or six degrees. The following are some of the temperatures of different individuals, which we have taken for several years past with common thermometers:—

Temp. of atmosphere:	raised by *Arum* to
65° { in vinery. / 45° out of doors. }	80° (in vinery.)
59°	65°
56°	61°
60°	73°
68°	75°
58°	62°
56°	60° (in spathe.)

Temp. of atmosphere:	raised by *Arum* to
50°	76° (evening.)
58°	72° (do.)
58°	72° (do.)
54°	80° (afternoon)
54°	84° (do.)
74° (in room)	83° (in room.)

The best of these observations show that the spadix was from 12° to 30° above that of the atmosphere, and these readings would unquestionably have been higher had better means been taken to ascertain the truth. Prof. Henslow says, "The spadix of the common Arum attains a temperature of 7° R. or 47¾° F. above that of the atmosphere, and the *Arum cordifolium* in the Mauritius has been observed to obtain a temperature of 44° to 49° R. or 131° to 142° F., that of the surrounding air being at 19° R. or 47¾° F. These effects take place only once for each plant." During the time of heat the spadix is, we believe, more pungent than at other times, and it seems to be giving out much moisture; for if laid upon a table or piece of glass, it quickly damps it as with steam. These interesting phenomena are, as Prof. Henslow remarks, doubtless produced by some chemical action; but, leaving this point for a brief mention hereafter, we will pass on to the results which follow from them.

(To be continued.)

A SYNOPSIS OF THE GENUS *SELAGINELLA*.

By J. G. Baker, F.R.S., &c.

(Continued from p. 213).

69. S. JUNGERMANNIOIDES Spring Mon. ii. 117; *Lycopodium jungermannioides* Gaudich.; *L. marginatum* Raddi, ex parte.—Stems trailing, much intermatted, 4–6 in. long, with a raised face and a flat back, copiously pinnately branched, the branches simple or little compound. Leaves of the lower plane crowded, spreading, oblong, obtuse, 1-12th in. long, dark green, moderately firm in texture, dilated, broadly rounded and strongly ciliated on the upper side at the base, and much imbricated over the branch; leaves of the upper plane ⅓ as long, oblique ovate, shortly cuspidate, much imbricated. Spikes ¼—½ in. long, square, ½ lin. diam.; bracts ovate, acute, strongly keeled.

Hab. Frequent in South Brazil *Gaudichaud*! *Glaziou* 7493! 7965! &c. I cannot separate specifically the Peruvian *S. applanata* A. Br. (Lechler 2405!). The Buenos Ayres *S. radiata*, Spring, is probably this species; but Aublet's Guianan *Lycopodium radiatum*, of which there is a type specimen at the British Museum, is *S. increscentifolia*, Spring.

70. S. TRUNCATA A. Br. in Ann. Sc. Nat., ser. 4, vol. xiii., 65.—Stems entirely trailing, slender, a foot long, bisulcate on the face, copiously pinnately branched, the branches with several short, ascending, pinnately arranged branchlets. Leaves of the lower plane crowded both on the branches and main stem, spreading, oblong, 1-12th to 1-8th in. long, very obtuse, dark green, rather firm in texture, the distinct midrib subcentral, both sides ciliated towards the base, the upper rather produced at the base and imbricated over the branch; leaves of the upper plane oblique, ovate, $\frac{1}{3}$ as long, minutely cuspidate, ciliated. Spikes $\frac{1}{4}$–$\frac{1}{2}$ in. long, square, $\frac{1}{2}$ lin. diam.; bracts ovate, acute, strongly keeled.

Hab. Andes of New Granada, *Karsten*, *Triana*. Eastern Peru, on Mount Guayrapurima near Tarapoto, *Spruce* 4024! A near ally of *S. Breynii*.

71. **S. longicuspis,** n. sp.—Stems 3–4 in. long, entirely trailing, terete on the face, flat or rather sulcate on the back, pyramidal in general outline, with a few erecto-patent slightly compound branches. Leaves of the lower plane spreading, close on the branches, rather spaced on the main stem, oblong-lanceolate, subacute, 1-12th to 1-8th in. long, bright green, and moderately firm in texture, the distinct midrib oblique, obscurely ciliated and rounded on the upper side at the base, a little imbricated over the branch; leaves of upper plane $\frac{1}{3}$ as long, ovate, with a cusp as long as the lamina. Spikes short, square, $\frac{3}{4}$ lin. diam.; bracts ovate, acute, strongly keeled.

Hab. Rio Janeiro, on the Tejuca mountains, *Glaziou* 7353! A near ally of *S. jungermannioides*, from which it may be readily known by the long cusps of the leaves of the upper plane.

72. S. BREYNII Spring Mon. ii. 119; *Lycopodium plumosum* Schk. Crypt., tab. 165, fig. 4.—Breyn. Exot. Cent., tab. 100; Dill. Musc., tab. 66, fig. 9.—Stems entirely trailing, flexuose, often a foot long, flat on the back, bisulcate on the face, copiously pinnately branched, the central branches with 5–7 short pinnately arranged branchlets. Leaves of the lower plane spreading, crowded, linear-oblong, $\frac{1}{6}$–$\frac{1}{5}$ in. long, obtuse or obscurely pointed at the upper corner, dark green, moderately firm in texture, the distinct midrib nearly central, the upper side strongly ciliated and rather produced at the base, and a little imbricated over the branch; leaves of the upper plane $\frac{1}{4}$ as long, oblique ovate, distinctly cuspidate, connivent, ciliated. Spikes $\frac{1}{2}$–1 in. long, square, $\frac{1}{2}$–$\frac{3}{4}$ lin. diam.; bracts ovate-lanceolate, crowded, strongly keeled.

Hab. Guiana and Brazil, especially in the Amazon Valley. According to A. Braun, Haenke's plant from the Cordilleras of Chili—referred to *Breynii* by Spring, *S. campylotis* A. Br. in Crypt.

New Gran. 357, *Lycopodium atrovirens* Presl in Rel. Haenk. i. 79, t. 12, fig. 2, non Wall.—is a distinct species, marked by leaves of the lower plane auricled on the upper side at the base, and leaves of the upper plane with a caudate auricle on the outer side at the base.

73. **S. platybasis**, n. sp.—Stem trailing, about a foot long, flat or sulcate down the face, copiously pinnately branched, the ascending branches cuneate, with 3–7 short flabellate branchlets. Leaves of the lower plane close, spreading, ovate-lanceolate, acute, 1-12th to 1-8th in. long, bright green, moderately firm in texture, the midrib distinct, the base on the upper side obscurely ciliated, dilated with a large auricle both laterally and downwards, so that those of the leaves of the opposite sides of the branch wrap over each other; leaves of the upper plane $\frac{1}{3}$ as long, oblique-ovate, with a short cusp. Spikes short, square, 1 lin. diam.; bracts ovate-lanceolate, strongly keeled.

Hab. North Brazil, in moist caatingas near Panuré, *Spruce* 2502! General habit near that of *S. Breynii*, but leaves very different in shape.

74. S. CALOSTICHA Spring Mon. ii. 206.—Stem trailing, rather rigid, about a span long, strongly angled on both faces, pinnately branched, the branches little compound. Leaves of the lower plane crowded, ovate-lanceolate, subacute, 1-5th in. long, spreading, subrigid, not ciliated, the midrib subcentral, the base of the upper side rounded and a little dilated; leaves of the upper plane $\frac{1}{3}$ as long, ovate-lanceolate, with a long cusp. Spikes short, square; bracts ovate-lanceolate.

Hab. Mountains of Caracas, at 5000 feet, *Funk & Schlim* 3321.

75. S. DENSIFOLIA Spruce in Hook. 2 Cent. Ferns, t. 85.—Stem 4–6 in. long, decumbent, except at the tip, copiously pinnate, with assurgent sparingly compound branches. Leaves of the lower plane crowded both on the branches and main stem, oblong-lanceolate, 1-12th to 1-8th in. long, obtuse, more or less ascending, firm in texture, bright green, more produced on the upper side of the midrib, ciliated on both edges towards the base, cordate on the upper side and much imbricated over the branch; leaves of the upper plane $\frac{1}{3}$ as long, ovate, acute, not cuspidate, much imbricated. Spikes short, square, $\frac{1}{2}$ lin. diam.; bracts acute-lanceolate, strongly keeled.

Hab. On the Orinoco, in damp shady places, at Cerro de Morro, *Spruce* 3809!

76. S. DENUDATA Spring Mon. ii., 84; *Lycopodium denudatum* Willd.—Stems trailing, a span long, subterete, striated, irregularly branched, the very flaccid branches laxly sparingly branched. Leaves of the lower plane crowded towards the tip of the branchlets, spaced on the stem, ovate, subobtuse, a line long, horizontal, rather rigid in texture, not ciliated, subequilateral, subcordate on both sides at the base; those of the upper plane but little smaller, ovate, acute. Spikes short, square; bracts ovate-lanceolate, strongly keeled.

Hab. Jamaica, *Swartz*. I have not seen this.

77. S. DIDYMOSTACHYA Spring Mon. ii., 130; Fée Fil. Ant. t. 34, fig. 4; *Lycopodium didymostachyum* Desv., *L. denudatum* H. & G.—Stems trailing, ½–1 ft. long, pyramidal in general outline, often forked low down, angled upwards on the face, copiously pinnate, the branches rhomboid and copiously compound. Leaves of the lower plane close on the branchlets, spaced on the stem, ascending, oblong, obtuse, ¾–1 lin. long, bright green, moderately firm in texture, more produced on the upper side of the midrib, where it is cordate at the base and much imbricated over the stem; leaves of the upper plane half as long, ovate, minutely cuspidate. Spikes ¼–½ in. long, square, ½ lin. diam.; bracts ovate, acute, crowded, strongly keeled.

Hab. Mountain woods of Jamaica and San Domingo. There is a specimen in the Smithian herbarium from Swartz, from Jamaica, of a dwarf variety with suborbicular close rigid leaves of the lower plane not more than ½ lin. long.

78. **S. guatemalensis,** n. sp.—Stems trailing, about ½ ft. long, pyramidal in general outline, convex on the face, flat on the back, copiously pinnate, the branches copiously compound. Leaves of the lower plane crowded, ascending, 1 lin. long, lanceolate, acute, bright green, moderately firm in texture, rather more produced on the upper side of the midrib, strongly ciliated at the base, and so much rounded and imbricated that the branch is quite hidden; leaves of the upper plane a third as long, oblique oblong-lanceolate, shortly cuspidate. Spikes square, ¼–⅓ in. long, ¾–1 lin. diam.; bracts ovate-lanceolate, crowded, strongly keeled.

Hab. In Guatemala at Coban, *Salvin & Godman*! In Nicaragua at Chontales, *R. Tate*!

79. **S. producta,** n. sp.—Stems 6–12 in. long, trailing in the lower half, the end and branches assurgent, flat or terete on the back, bisulcate on the face, forked low down and copiously pinnately branched, with short ascending branches. Leaves of the lower plane spreading or ascending, close, oblong-lanceolate, subacute, 1-12th to 1-8th in. long, moderately firm in texture, much more produced on the upper side of the distinct midrib, very cordate, shortly ciliated at the base and imbricated quite across the branch; leaves of the upper plane oblique ovate, shortly cuspidate, imbricated. Spikes copious, square, ¼–1 in. long, 1 lin. diam.; bracts ovate, acute, much imbricated, strongly keeled.

Hab. British Guiana, *Appun*! *Drake*! Amazon Valley, *Spruce* 2043! Minas Geraes, *Lindberg*! Habit of *S. flexuosa*, from which it recedes by the very cordate upper base of the leaves of the lower plane. Spruce 4731, from the Rio Negro, comes midway between the two species. Spruce 2195, from the falls of Sao Gabriel, differs from the type by its narrower and more decidedly acute leaves of the lower plane, which are also less cordate on the upper side at the base.

80. S. GUYANENSIS Spring Mon. ii., 134.—Stems decumbent, above a foot long, subterete, copiously pinnate, the branches but little compound. Leaves of the lower plane spreading, linear-oblong, middle-sized, subobtuse, three times as long as broad,

nearly equal-sided, serrulate, subcordate and shortly ciliated on the upper side at the base; leaves of the upper plane very small, cordate ovate, with a large cusp. Spikes square, ½ in. long; bracts ovate cuspidate, strongly keeled.

Hab. French Guiana, *Leprieur*. A near ally of *S. Gardneri*.

81. S. GARDNERI Spring Mon. ii., 134; *S. geminata* Fée Fil. Bras. Suppl. 100, tab. 108, fig. 4.—Stems ½–1 ft. long, decumbent throughout, or assurgent in the upper half, copiously pinnate, moderately stout, flat on the back, convex on the face, the ascending branches copiously flabellate-pinnate. Leaves of the lower plane spreading, slightly spaced, nearly oblong, subobtuse, 1-12th to 1-8th in. long, dark green, firm in texture, minutely ciliated on both sides, very cordate on the upper side at the base and much imbricated over the stem; leaves of the upper plane half as long, imbricated, oblique ovate, with a distinct cusp. Spikes ¼–½ in. long, 1 lin. diam., square; bracts ovate-cuspidate, crowded, strongly keeled.

Hab. Organ Mountains, *Gardner* 5958! *Glaziou* 4484! 7282! In the type the root-fibres are confined to the nodes of the lower part of the stem. *S. ericoides* Fée Fil. Bras. 228, tab. 75, fig. 2, is a decumbent variety with shorter leaves, and root-fibres extending to the upper nodes; and *S. macrostachya* Spring Mon. ii., 133, is a suberect form, with unusually long spikes (½–1 in. long).

82. S. FLEXUOSA Spring Mon. ii., 131; *S. bella* Fée Fil. Bras. Suppl. 100, t. 108, fig. 3; *Lycopodium stoloniferum* Radd. Fil. Bras. 81, t. 2; *L. brasiliense* Desv.—Stems about a foot long, flat on the back, subterete on the face, copiously branched, the lower branches elongate and copiously compound, the upper part assurgent and root-fibres often only developed from the lower half. Leaves of the lower plane close, spreading, bright green, oblong-rhomboidal, subacute, ⅛–⅙ in. long, moderately firm in texture, more produced on the upper side of the distinct midrib, serrulate on the upper side near the base, where it is rounded and a little imbricated over the branch; leaves of the upper plane a third as long, ovate, with a long cusp. Spikes ½–1 in. long, square, ¾–1 lin. diam.; bracts ovate-lanceolate, ½ lin. long, crowded, sharply keeled.

Hab. Common in South Brazil.

83. **S. Seemanni,** n. sp.—Stems trailing, about ½ ft. long, the root-fibres not extending to the upper nodes, 1–2-sulcate on the face, flat or terete on the back, pyramidal in general outline, copiously pinnate, the lower branches elongated, copiously compound. Leaves of the lower plane crowded on the branchlets, spreading or rather ascending, oblong-lanceolate, acute, 1-12th to 1-8th in. long, moderately firm in texture, rather more produced on the upper side of the distinct midrib, broadly rounded and ciliated at the base, and a little imbricated over the branch; leaves of the upper plane a third as long, ovate, imbricated, shortly cuspidate. Spikes short, copious, 1–1½ lin. diam., not sharply square; bracts ovate-lanceolate, ½ lin. long.

Hab. Cacaqua, New Granada, *Seemann* 1006! A near ally of *S. flexuosa*.

(To be continued.)

FERNS COLLECTED BY THE REV. J. HANNINGTON IN E. TROPICAL AFRICA.

By J. G. Baker, F.R.S.

The following is a list of a small collection of *Pteridophyta*, gathered recently by the Rev. J. Hannington, of Hurstpierpoint, in an expedition made from Zanzibar to the Victoria Nyanza Lake, with descriptions of the novelties. The ferns were mainly collected in the Usagura territory, between six and seven degrees south of the equator :—

Gleichenia dichotoma Hook.
Davallia thecifera H. B. K.
Actiniopteris radiata Link.
Pteris quadriaurita Retz.
P. aquilina L.
Adiantum lunulatum Burm.
A. Capillus-veneris L.
A. hispidulum Sw.
Pellæa hastata Link.
P. geraniæfolia Link.
P. Doniana Hook.
P. pectiniformis Baker.
Cheilanthes (*Adiantopsis*) *Schimperi* Kunze.

29* **Asplenium** (Euasplenium) **Hanningtoni,** n. sp. — Stipes densely tufted, about ½ in. long, green, filiform. Basal paleæ minute, brown, lanceolate. Lamina lanceolate, 2–3 in. long, green, glabrous, tailed at the end, moderately firm in texture. Pinnæ distant, deltoid, ⅙ in. broad, subpetioled, with 2–3 conspicuous round lobes on the outer margin. Veins few, distant, flabellate. Sori 1–2 to a pinna, central, oblong. Indusium green, membranous, persistent, with a dentate margin.—Allied to *A. vagans* Baker, from which it differs by its slender filiform rachis and distant pinnæ, the lower subopposite, the upper alternate.

Asplenium pumilum Sw.
A. formosum Willd.
Nephrodium albo-punctatum Desv.
N. molle Desv.
Nephrolepis cordifolia Presl.
Polypodium (*Drynaria*) *Willdenovii* Bory.

18* **Notochlæna tricholepis,** n. sp. — Rootstock not seen. Stipes wiry, castaneous, 2–3 in. long, clothed in the upper part with dense adpressed small brown hair-like paleæ, which cover the whole rachis. Lamina oblong-lanceolate, bipinnate, 4–5 in. long, green and thinly pilose above, densely clothed all over beneath with a thick coat of brown or drab tomentum. Pinnæ lanceolate-deltoid, sessile, more produced on the lower side, cut down to the rachis into close entire obtuse lingulate pinnules ⅛ in. broad. Sori brown, forming a dense border all round the pinnules. Allied to the American *N. mollis* Kunze.

Ophioglossum reticulatum L.
Selaginella rupestris Spring.
S. Mittenii Baker.
Azolla nilotica Decne.

SHORT NOTES.

A New British Plant.—Najas major All.—On the 21st of July last, while examining the aquatic vegetation of Hickling Broad, in East Norfolk, the drag brought up fragments of a plant that I at once recognised as *Najas major*. Further search showed it to be distributed over a good space of ground, the distance between the first found and the last being about a mile. With it were growing *Potamogeton pectinatus*, *Chara stelligera*, *C. hispida*, *C. polyacantha*, &c.—Arthur Bennett.

Hybernacula of Utricularia intermedia. — Writing of the occurrence of this plant in Mayo and Galway, Mr. H. C. Hart says (Proc. Royal Irish Academy, 2nd ser., iii., 700):—"This plant forms hybernacula, and if the fragile stem be lifted gently and traced through the mud with the fingers for the root, a little tuberous formation about the size of a bean will usually be found at the end of the stem. This habit is not mentioned in the British text-books, but Mr. Baker informs me that there are specimens exhibiting these hybernacula at Kew. I have seen undeveloped leaf-buds of *U. vulgaris* at the end of the summer, although not so dense; and Darwin says these "fall off and lie dormant during the winter at the bottom," In *U. intermedia* they remain attached, and from the point at which the arrested growth recommences the following season. Such a means of living is the more necessary to the present species, since it rarely seeds itself."

Elymus arenarius in Co. Dublin.—In the middle of last June I found this rare and handsome northern grass on the coast below Skerries in two places profusely, a locality which has not been much botanized. Close by, *Trifolium scabrum* grows in great abundance. The *Elymus* occurs south of this, on the east of Ireland on the Wexford coast, but is hardly, as I think, native. The present habitat, which is quite satisfactory, is perhaps the southernmost limit of its indigenous range in Ireland. In the same locality I also observed *Salvia Verbenaca*, apparently at its northernmost habitat.—H. C. Hart.

Carex distans inland.—This littoral plant grows at Pidley, in Huntingdonshire, amongst high and grass on a gravelly loam, about a quarter of a mile from the peat soil of the fens, and thirty miles from the salt water of the Wash at Lynn. I have gathered the same form on the shore at Hunstanton. The late Mr. H. C. Watson named the sea-side plant for me, and I am indebted to Messrs. Baker, A. Bennett, and Babington, for the determination of the Pidley specimens, which closely resemble those from Hunstanton.—Alfred Fryer.

Carex muricata L. var. pseudo-divulsa in Worcestershire.—While out botanizing with Mr. R. F. Towndrow at Malvern Link, we met with a Carex which Mr. Arthur Bennett has confirmed as the above. It was growing with *Carex divulsa* Good. We saw about three or four plants of it.—Alfred Waller.

Dioscorea Swinhoei Rolfe (Journ. Bot. 1882, p. 359) is, we are informed by Dr. Hance, indentical with his *D. dorypliora*, published in Ann. Sci. Nat. (Bot.), 5th S. v. 244 (1866).

VEGETATION OF COQUIMBO.

[We are indebted to Mr. John Ball for the following abstract of a letter recently received by him from Prof. F. Philippi.]

Professor Frederick Philippi, the son of the veteran explorer of Chili, has lately returned from a very interesting excursion in the province of Coquimbo, still imperfectly known to naturalists. Although Coquimbo lies but a short distance north of Valparaiso—the province extends from about 29° S. to 31° S.—it is known that the climate is remarkably different, as its northern border is on the verge of the so-called rainless zone, and the annual rainfall in the coast region ranges from five to ten inches only. In the low country near Ovalle on the river Limari the vegetation consists mainly of *Cacteæ* and shrubby *Compositæ*, with a few fruticose representatives of other natural orders, of which *Cordia decandra* is mentioned as especially ornamental. Herbaceous vegetation is extremely scanty, and scarcely to be found except in spring. From Ovalle Prof. Philippi proceeded to visit a range of hills running parallel to the coast, which is named on Petermann's map *Altos de Talina*, and tinted as extending from 500 to 1000 metres in height. This range is known in the country as the mountain of *Frai Jorje*, and the height is estimated by Mr. Philippi at about 1500 metres. During the greater part of the year the summit is covered with a stratum of fog which extends downward for a few hundred feet, and then abruptly ceases. On making the ascent he found to his surprise that the upper part, exactly coinciding with the limit of the fog, for a distance of 8 or 9 miles in length and varying from half a mile to three miles in breadth, is covered with wood of a character exactly agreeing with the forests about Valdivia in the rainy region of southern Chili, about ten degrees farther south. The prevailing tree is *Æxtoxicum punctatum*, with abundance of mosses and southern ferns, including *Asplenium magellanicum*. In descending the mountain Prof. Philippi was struck by the extreme abruptness of the change in the vegetation on emerging from the fog zone. "A few steps farther down," as he states, he found Pourretias, *Haplopappus*, and other species of the arid region. The existence of such southern plants in this region is of course explained by the constant fogs supplying moisture and screening them from intense solar radiation; the difficulty, as he justly remarks, is to account for the transport of so many species over a wide area affording, so far as we know, no resting-place in the present conditions of climate. Some species may possibly have extended along the range of the Andes and thence been carried to the coast, and it is possible that when the migration of birds on the western side of the continent is more

fully known some further light may be thrown on the subject. As the season advanced Prof. Philippi turned his course to the portion of the Cordillera range lying near the sources of the river Vacuna, and was able to make very interesting botanical collections which probably include several new forms. But of even greater interest are the geological observations made by him during this excursion. Excepting at one point, where they are broken by the protusion of a pyroxenic rock, Prof. Philippi found this portion of the Andes to be entirely composed of stratified deposits, and at a height of about 4500 metres he found a bed of jurassic fossils, of which specimens were secured.

The more detailed account of this interesting expedition which Professor Philippi will doubtless give to the public will be anxiously awaited by naturalists in Europe.

NOTICES OF BOOKS.

The Fertilisation of Flowers. By Prof. Hermann Müller. Translated and edited by D'Arcy W. Thompson, B.A., Scholar of Trin. Coll., Cambridge. With a Preface by Charles Darwin. With Illustrations. London: Macmillan & Co., 1883; pp. x. 669.

Prof. Hermann Müller, of Lippstadt, has long earned for himself the first place among the observers of those relationships between the needs of insects for obtaining honey from flowers and the needs of plants for having their pollen conveyed from flower to flower, which have thrown such a flood of light on the structure of both insects and flowers. It needed a trained entomologist and botanist in one, and at the same time a man of keen powers of observation and unwearied industry, to solve the problems which arose in each separate case of mutual adaptation—a task which has been performed with astonishing success in Müller's two great works, 'Die Befruchtung der Blumen durch Insekten' and 'Alpenblumen, ihre Befruchtung durch Insekten.' Mr. D'Arcy Thompson now presents us with a translation of the former of these two works, in which he has inserted also references to, or very short abstracts of, the results recorded in the second of them also. A fuller account of these would have made the work a more complete record of our present state of knowledge regarding the part played by insects in the fertilisation of flowers.

The families of insects concerned in the fertilisation of flowers are mainly four, viz.:—in the order of their importance (1), Hymenoptera, chiefly Apidæ; (2) Diptera, chiefly Syrphidæ; (3) Lepidoptera; (4) Coleoptera. The special adaptations of structure of the insects belonging to these groups for the obtaining of nectar and pollen, and for the transmission of pollen, are most clearly described by Prof. Müller in the introductory portion of his work, the understanding of the text being aided by admirable

drawings of the various parts concerned of the different insects. The greater part of the volume is then occupied with a description of every species of plant observed by the author, as far as regards its floral structure, with special reference to its adaptation to the visits of insects; and to this is appended a list of all the insects observed by him to visit this particular species. A mass of observation is thus accumulated which is invaluable to the student of this most interesting branch of Natural History. It is not too much to say that every page teems with information of the most interesting and valuable kind. And, vast as is Prof. Müller's accumulation of facts, the ground yet unworked is vaster still, and is one in which every young naturalist of assured accuracy of observation can work. It needs only some knowledge of insects and of flowers, a collecting vasculum and a pair of fly-catching forceps, a drawing-block and a pencil, and an addition to our store of knowledge may be gained. This will be further increased by a compound microscope for the purpose of observing the more minute points of structure in both insect and flower, and the form and size of the pollen-grains found attached to the hairs on the body of the insect.

Mr. D'Arcy Thompson has rendered good service to the English naturalist unacquainted with German in this translation. As far as we have observed, the rendering is faithful and accurate; and in one respect the English translation is decidedly superior to the original—in the more scientific arrangement of the species described, following the system of Bentham & Hooker's 'Genera Plantarum,' instead of the very unsatisfactory German classification, which begins with *Juncaceæ* and ends with *Valerianaceæ*. The kindly preface from the pen of Mr. Darwin was one of the very last of his writings. A most useful bibliography of the subject (which has also been issued separately) adds greatly to the value of the work. A. W. B.

General Index to the Latin names and Synonyms of the Plants depicted in the first 107 *volumes of Curtis's Botanical Magazine, to which is added a Short List of Popular Names.* Edited by Edmund Tonks, B.C.L. 8vo., pp. vi., 263. London: Quaritch, 1883.

The importance of general Indexes to figures of plants must have been felt by every working botanist who does not confine his studies to our British Flora. Pritzel's 'Index Iconum' is a work hardly second to his 'Thesaurus' in usefulness, but while the latter work has been brought down to the end of 1880, by Mr. Jackson's persevering labours, the former has received no addition since 1866, nor do we hear that any further supplement is in contemplation. What botanists feel with regard to figures of plants in general, Mr. Edmund Tonks felt with regard to the 'Botanical Magazine' in particular; and, the Index now before us having been prepared "by an enthusiastic naturalist, Mr. Henry Buckley, for his own use," he undertook to edit it and bring it before the public.

Mr. Tonks deserves all credit for his good intentions, and his

work will no doubt be useful to the country gentlemen and others who have sets of the 'Botanical Magazine' upon their shelves. The volume is well printed, every other page being blank, to allow of the interlineation of additions. But we regret that he did not see his way to following the advice of "the authorities at Kew," who said "that to be a creditable performance the index should be revised by a competent botanist." Mr. Tonks frankly tells us "that he is not a botanist, but only a lover of plants"; and his having "taken some liberties with the names" is evidence of this, as well as his justification of this line of conduct by the statement that "botanists' nomenclature is very curious, and apparently limited by no rules"!

One or two instances of the mode of treatment adopted will serve to give an idea of the insufficiency of the book. Mr. Tonks says that the editors have "frequently made the mistake of re-illustrating plants already depicted in their own work." Opening his Index at random we find what seems at first sight to be an instance of this—

"*Cypripedium parviflorum* 22, 911
——— ——— 57, 3024."

But on consulting the text to plate 3024 we find that "*C. parviflorum* of Old Series of Bot. Mag. t. 911, should assuredly be referred to *C. pubescens*." A botanist would have noticed this correction, but Mr. Tonks, naturally enough, has not done so; so that his Index contains two references to *C. parviflorum*, while *C. pubescens* is altogether omitted. *Cobœgia trichroma*, again, figured on t. 3867, was repeated on t. 5686, not through any "mistake," but because the earlier plate "gives so little idea of its size and beauty that another figure [was] absolutely required." No doubt in some cases Mr. Tonks's censure is deserved, as in that of *Begonia Wageneriana*, figured on t. 4988, and again on t. 5047.

The index of synonyms, as given in the same 107 volumes, also suffers from want of botanical supervision. A botanist would not have passed as a synonym such a fragment of an old descriptive phrase as "*Alsine forte*;" and would have discriminated between useful synonymy and such as is practically useless. Nor can we commend the "Index of Popular Names." "Fair Maids of France," for instance, is not a popular name for the genus *Ranunculus*, as Mr Tonks seems to imply, but only for one species, *R. aconitifolius*, fl. pl.

We cannot help feeling sorry that Mr. Tonks did not add to his Preface a sketch of the history of the 'Botanical Magazine.' Extending back, as it does, for nearly a century, such a sketch, with lists of the botanists and artists engaged upon the work, would have been both useful and interesting, and would have added value to this General Index.

We are indebted to our correspondent, Mr. H. C. Hart, for copies of two papers published by him in the last number (2nd Ser. vol. iii. (Science), no. 10, June, 1883) of the 'Proceedings of the Royal Irish Academy.' The first is entitled "Notes on the

Flora of Lambay Island, Co. Dublin," and is so evidently a complete catalogue of the plants of this small island that the two first words seem calculated to convey a false impression of the paper. "Disregarding several subspecies or varieties, the flora consists of 291 flowering plants and ferns, of which 33 species are probably not native." An interesting comparison is instituted between the flora of this island on the east coast and that of Inishbofin on the west. Mr. Hart's second paper is a "Report on the Flora of the mountains of Mayo and Galway." His most important find is *Saxifraga cæspitosa*, which "has rested hitherto as an Irish plant upon the evidence of an imperfect specimen from Brandon, gathered in 1829." Mr. Hart found this species upon Muckanaght, one of the Twelve Bens, or "Twelve Pins," as they are popularly called, of Connemara; and his identification has been confirmed by Mr. Baker. His notes upon the vertical range and distribution of certain plants are full of interest. With regard to the range of *Saxifraga umbrosa*, however, Mr. Hart points out in a letter to us, that the statement that it "never descends lower than 1700 or 1800 feet in the Tipperary and Waterford range" requires qualification, inasmuch as he has found it in or near the river-courses at 600 or 700 feet above sea-level—a correction which we are able to corroborate from our own observation. We extract a note from this paper at p. 246, and regret that we have not space for further notice of this interesting contribution to our knowledge of Irish plants.

Mr. Van Voorst (Paternoster Row, E.C.) has issued two pages of 'Addenda to the Eighth Edition of Babington's Manual of British Botany,' which may be obtained on application by possessors of the work. Descriptions are given of *Selinum Carrifolia*, *Spartina Townsendi*, *Agrostis nigra*, and *Lycopodium complanatum*, and various corrections are made. "Ringwood Chase, near Ludlow," is given as a locality for *Epipogum aphyllum*.

We are glad to learn that Mr. Alfred Fryer is engaged upon a Flora of Huntingdonshire, in which he will be glad of help. His address is Chatteris, Cambridgeshire.

The recently issued part of the 'Proceedings of the Bristol Naturalists' Society' contains a further instalment (the *Corollifloræ*) of the 'Flora of the Bristol Coal-field,' as well as the sixth part of Mr. Cedric Bucknall's 'Fungi of the Bristol District.' In the latter are descriptions of two new species—*Peziza Arctii* Phillips, *Stictis pteridina* Phill. & Buck. We would suggest that the extracts from Sir J. E. Smith, and similar notes upon the general history of the species, might well be omitted.

Two recently-issued parts (iv. and v.) of the 'Transactions of the Yorkshire Naturalists' Union' contain reports on Yorkshire botany for 1879 and 1880, with the conclusion of Dr. Parsons' list of the mosses of the East Riding, and a list by Dr. Spruce of the *Hepaticæ* of the same district. The plate of *Carex pilulifera*, var. *Leesii* which appeared in this Journal for 1881 accompanies part v. The date of these reports suggests that our Yorkshire

friends are a little behindhand with their work; but it is gratifying to see how thoroughly they confine their publication to matters connected with the natural history of their district.

Mr. William Hodgson publishes some 'Notes on the Flora of the Ullswater District' in part vii. of the Transactions of the Cumberland Association for the Advancement of Literature and Science. What appears to be a very complete list of the plants found within the district of Lake Ullswater is given as an appendix.

We are glad to welcome an addition to our local natural history publications in the shape of 'The Rochester Naturalist: a Quarterly Record of the Rochester Naturalists' Club.' Mr. John Hepworth gives a paper on "Rochester Umbelliferæ," with a localised list of the species found in the district, and the report of the club evidences botanical work. We hope the Rochester naturalists will obtain sufficient support to encourage them to continue this well-printed little journal, which is issued (by Wildish, Rochester) at the very low cost of 1*s*. per annum.

Mr. H. D. Geldart publishes a list of the Marine Algæ of Norfolk in vol. iii. of the 'Transactions of the Norfolk and Norwich Naturalists' Society.'

The last part (fasc. 89) of the 'Flora Brasiliensis' contains the beginning of the *Melastomaceæ* (*Microliciæ*), by Prof. Cogniaux.

'The Westbury House School Ephemeris' is a little monthly journal issued by a school at Worthing in which commendable prominence is given to local Natural History. We would beg our young friends, however, to refrain from publishing new and undescribed varieties of plants—such as "*Lychnis vespertina intermedia* MS." and "*Polygala vulgaris erecta* MS.," and to pay a little more attention to the spelling of proper names.

Mr. C. Ford, of the Botanic Gardens, Hong Kong, sends us a printed "Index of Chinese Plants in Journal of Botany, vols. i. to xviii.," which, we believe, was mainly compiled by Mr. F. B. Forbes for his own use, and has been put in type for the benefit of those specially interested in the Chinese Flora, to whom it cannot fail to be useful.

The 'Report and Transactions for the year 1882' of the Birmingham Natural History and Microscopical Society forms a neat 8vo volume, the Report occupying 57 and the Transactions 133 pages. The latter are reprinted from the 'Midland Naturalist,' and include Mr. W. B. Grove's papers on the *Myxomycetes* and on the reclassification of the *Uredineæ*. We should like to see greater prominence given to local matter.

The recently issued part of the 'Philosophical Transactions' contains a long and important paper on the botanical results of experiments on the mixed herbage of permanent meadows, conducted for more than twenty years in succession on the one land, by Sir J. B. Lawes and Drs. Gilbert and Masters. We hope to recur to this on an early occasion.

The last part (concluding vol. vii.) of the 'Proceedings of the Linnean Society of N. S. Wales' contains descriptions of eight new Agarics and a Sclerotium, by the Rev. C. Kalchbrenner; a continuation of the Rev. J. E. Tenison-Wood's 'Botanical Notes on Queensland; a paper by the same author on a species of *Brachyphyllum* from Mesozoic Coal-beds, Ipswich, Queensland; and an interesting account of *Utricularia dichotoma*, by E. Haviland.

New Books. — R. Bentley, 'Student's Guide to Structural, Morphological, and Physiological Botany' (8vo, pp. xiii. 482: J. & A. Churchill). — J. Vallot, 'Recherches physico-chimiques sur la terre végétale' (8vo, pp. xv. 344: Paris, Lechevalier). — L. Crié, 'Nouveaux Eléments de Botanique'* (8vo, pp. vi. 1158; Paris, Doin).—C. Salomon, 'Nomenclator der Gefässkryptogamen' (8vo, pp. x. 385: Leipzig, Voigt). — E. Lambert, 'Traité pratique de Botanique' (8vo, pp. 501: Paris, Firmin-Didot). — J. D. Hooker, 'Flora of British India' (part x. (*Asclepiadeæ—Scrophularineæ*) pp. 256: L. Reeve). — A. Oborny, 'Flora von Mähren und österr. Schlesien' (8vo, vol. i., pp. 268: Brünn, Burkart). — H. Baillon, 'Traité de Botanique Médicale Phanerogamique' (fasc. i., 8vo, pp. 720: Paris, Hachette). — E. Tonks, 'General Index to . . . . . 107 vols. of Curtis's Botanical Magazine' (royal 8vo, pp. vi. 263: London, Quaritch, £1. 1*s.* 0*d.*). — H. Müller & D'Arcy W. Thompson, 'The Fertilisation of Flowers' (8vo, pp. x. 669: London, Macmillan, £1. 1*s.* 0*d.*). — L. H. Grindon, 'The Shakspere Flora' (8vo, pp. xii. 318: Manchester, Palmer & Howe, 7*s.* 6*d.*).—M. T. Masters, 'Plant Life' (8vo, pp. viii. 142: London, Bradbury, Agnew & Co., 2*s.* 6*d.*). — A. DeCandolle, 'Nouvelles Remarques sur la Nomenclature Botanique' (8vo, pp. 79: Genève, Georg. — J. Hofmann, 'Flora des Isar-Gebietes' (8vo, pp. lxlv. 377: Landshut, 3 *m.*). — W. von Zwackh-Holzhausen, 'Die Lichenen Heidelbergs' (8vo, pp. iv. 53: Heidelberg, Weiss). — H. C. Watson, 'Topographical Botany,' ed. 2 (8vo, pp. xlvii. 612: London, Quaritch, 16*s.*).

Articles in Journals.

American Naturalist.—J. B. Ellis, 'Notes on Study of Fungi.'

Botanical Gazette (June). — J. H. Redfield, Biography of Dr. William Baldwin (1779—1819). — E. J. Hill, '*Aster* or *Solidago?*' —A. F. Foerste, 'Morphological Notes' (on bud-scales). — (July). H. W. Ravenel, Biography of Stephen Elliott (1771—1830).— G. Engelmann, '*Vitis palmata* Vahl.' — W. G. Farlow, '*Phallus togatus* Kalchbr.' (= *P. duplicatus* Bosc.).

Botanische Zeitung (June 8–29). — H. Kurth, '*Bacterium Zopfii*' (1 plate).—(July 6). J. Wiesner, 'Ueber die Wachsthumsweise des Epicotyls von *Phaseolus multiflorus*.' — P. Anderson, 'Zur Geschichte der Wurzelknotenbehaarung.' — (July 13). J. Wortmann, 'Ueber den Einfluss der strahlenden Wärme auf wachsende Pflanzentheile.'

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* The date on the title-page is 1884.

Botanisches Centralblatt (No. 23).—J. H. Wakker, 'Ueber Hyacinthen Krankheiten.' — (No. 24). V. v. Borbás, '*Epilobium Kerneri* Borb.' — (No. 25). N. Pringsheim, 'Ueber der vermeintlichen Amöben in den Schläuchen und Oogonien der Saprolegnieen.'

Bull. Bot. Soc. France (xxx., pt. 2; July). — A. Legrand, 'Notices sur quelques plantes critiques ou peu communes' (*Polygonum Debeauxii*, n. sp.; Corsica, Debeaux, 6 Oct., 1869).—E. Mer, 'Du dépérissement des cimes d'Epicea.' — V. Payot, 'Sur une transformation du *Rosa alpina*.' — C. Flahault, 'Sur quelques formes de *Nostoc*' (1 plate).—E. Prillieux, 'Le Tacon des Safrans.' — C. E. Bertrand, 'Sur la nature morphologique des rameaux aériens des *Psilotum* adultes.' — M. Mazé, 'Nomenclature des Arbres à la Guadeloupe, avec leurs noms vulgaires.' — E. Mer, 'Recherches sur les causes de la structure des feuilles.'

Bulletin of Torrey Botanical Club (June). — G. E. Davenport, *Cheilanthes Pringlei*, sp. n. (with plate). — C. H. Peck, *Cæoma Cheilanthis*, sp. n. (found on fronds of preceding).—F. L. Scribner, 'Grasses from Washington Territory' (*Agrostis foliosa* Vasey ined. (nomen solum), *Deyeuxia Tweedyi* Scribn., *Trisetum Brandegei* Scribn., *Poa nevadensis*, Vasey ined., spp. nn.).

Flora (May 11). — H. Dingler, 'Beiträge zur orientalischen Flora II.' (*Peucedanum Spreitzenhoferi*, *Johrenia Engleri*, spp. nn.). —F. Pax, Flora des Rehborus bei Schatzlar' (contd.).— (May 21). '*Leskea? Heldreichii* Fehlner, n. sp.' (1 plate). — A. Zalewski, 'Ueber Sporenabschnürung und Sporenabfallen bei den Pilzen.'— (June 1). J. Müller, 'Lichenologische Beiträge' (*Heuffleridium*, *Campylothelium*, *Pseudopyrenula*, gen. nov.).—(June 11 & 21). Id., (*Haplopyrenula*, gen. nov.).—(July 1). E. Neubner, 'Beiträge zur Kenntniss der Caliceen' (3 plates). — H. Dingler, 'Beiträge orientalischen Flora' (*Aristolochia Bodamæ*, n. sp.). — (July 11). Continuation of Nueber's and Müller's papers. — (July 21). P. Reinsch, 'Ueber parasitische Algen ähnliche Pflanzen in der Russischen Blätterkohle und über die Natur der Pflanzen, welde diese Kohle zusam mensetzen' (3 plates). — (Aug. 1).* Conclusion of Reinsch's and Müller's papers (*Willeya* Mull. Arg., gen. nov.)— (Aug. 11). P. F. Reinsch, 'Ein neuer algoider Typus in der Stigmarienkohle von Kurakino (Russland)' (1 plate).—Id., 'Notiz ueber die neuerdings in dem Polarkreise entdeckten Steinkohlenflötze.' — H. Karsten, 'Zur Kenntniss der Entwickelung der Cinchonen-Alkaloide.'—(Aug. 21). C. Warnstorf, 'Die Torfmoose des v. Flotow'schen Herbarium im Königl. bot. Museum in Berlin' (1 plate). — H. Hoffmann, '*Torrubia cinerea* Tul. f. *brachiata*' (1 plate). — A. Heimerl, 'Ueber *Achillea alpina* L. und die mit diesem Namen bezeichneten Formen.' — (Sept. 1). Heimerl on *Achillea alpina*, and Pax on Flora des Rehborus (contd.).

Garden (June 30). — *Sisyrinchium grandiflorum*, ic. pict. — (July 21). *Calanthe Regnieri*, ic. pict.

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* The Editor explains that his approaching absence from home has caused him to send out the following numbers antedated.

Gardeners' Chronicle (June 30).—*Calanthe Forstermanni* Rchb. f., *Saccolabium Berkeleyi* Rchb. f., spp. nn.—*Primula Stuartii* (fig. 138). —(July 7). *Epidendrum inocentrum* Rchb. f., *Warscewiczella picta* Rchb. f., *Cypripedium Curtisii* Rchb. f., spp. nn. — *Hoya linearis*, var. *sikkimensis* (figs. 1, 2). — J. G. Baker, 'Species of *Tulipa*' (contd.; *T. macrospeila*, sp. n,). — 'A hybrid Raspberry' (fig. 3).* —R. A. Rolfe, 'Peloria of *Tetramicra bicolor*' (fig. 5). — W. B. Hemsley, 'Why Figs cast their fruit.' — (July 14). *Masdevallia marginella* Rchb. f., *Rodriguezia hecana* Rchb. f., spp. nn. — *Plagiolirion Horsmanni* Baker (gen. & sp. n.).—*Amianthium muscætoxicum* (fig. 7). — 'List of Garden Orchids' (*Epidendrum*). — 'Growth of Conifers' (figs. 8, 9). — (July 21). *Spathantheum heterandrum* N. E. Brown (*Gamochlamys heterandra* Baker). — J. G. Baker, 'Specis of *Tulipa*' (contd.).—W. B. Hemsley, 'Social Life of Ants and Plants.' — 'Monstrous Cypripediums' (fig. 12). — (July 28). *Maxillaria irrorata* Rchb. f., *Cattleya Schroderiana* Rchb. f., *Æchmæa Barleei* Baker, spp. nn. — C. B. Plowright, 'Mr. Jensen and the Potato Disease.' — *Plagiolirion Horsmanni* (fig. 16). — *Sarcopodium Dearei*, sp. n. ? (fig. 17).

Journ. Royal Microscopical Soc. (June). — M. Morris & G. C. Henderson, 'Cultivation and Life-History of Ringworm Fungus (*Trichophyton tonsurans*' (1 plate).

Midland Naturalist. — W. B. Grove, 'Fungi of Birmingham' (contd.).

Naturalist. — R. M. Christy, 'Ferns of York.' — H. Boswell, 'New British Moss' (*Bryum gemmiparum*).

Nuov. Giorn. Bot. Ital. — M. Lojacono, 'Clavis specierum Trifoliorum.' — A. Mori, 'Sulla struttura delle foggli delle Ericacee.' — U. Martelli, 'Le Composte raccolte dal Doltor O. Beccari nell' archipelago Malese e nella Papuasia' (*Blumea Arfakiana*, *Senecio sumatranus*, *Lactuca Kanitziana*, spp. nn.).

Œsterr. Bot. Zeitschrift. — H. Zukal, '*Ephebe Kerneri*, sp. n.' (1 plate).—L. Celakovsky, '*Melica picta* C. Koch.' — V. v. Borbás, '*Rosa Pokornyana* Kmet.'—P. G. Strobl, 'Flora des Etna' (contd.). — B. Blocki, 'Beitrag zur Flora Galiziens und der Bukowiana' (contd.).

Pharmaceutical Journal (June 16).—W. Elborne, 'Commercial Rhubarbs.'—(June 23). W. R. Dunstan & F. W. Short, 'Analysis of authentic specimens of Nux Vomica.' — H. G. Greenish, '*Convallaria majalis*.' — (June 30). E. E. Sewell, 'Notes on Abnormal Flowers.'—(July 14). H. McCallum, 'Seeds of *Camellia drupifera*.'

Science-Gossip.—P. Ewing, 'Flora of Ben Laoigh' (Grampians: includes Mosses and Hepaticæ). — J. Spencer, 'Recreations in Fossil Botany (Sporocarpons and Zygosporites).' — W. B. Plowright, 'Æcidium of *Ranunculus Ficaria*.'

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* [This is said to be a hybrid between the Raspberry and the Strawberry; we are indebted to the Rev. W. W. Newbould for pointing out that the figure well represents *Rubus Idæus* var. *Leesii*.]

LINNEAN SOCIETY OF LONDON.

June 21, 1883.—Professor P. M. Duncan, Vice-President, in the chair.—The following gentlemen were balloted for and elected Fellows of the Society :—Messrs. Edmund J. Baillie, John Borland, Kenneth McKean, Edward C. Malan, and H. A. A. Nicholls.—A specimen of *Polyporus sulphureus* was exhibited for the Rev. A. A. Harland; it was obtained from the stem of a yew tree in the Clieveden Woods, Bucks.—A series of fossil fruits, &c., from Australia, were shown for Dr. C. E. Barnard; among these were species of *Phymatocaryon*, *Eisothecaryon*, *Ochthodocaryon*, *Spondylostrobus*, *Plesiocapparis* and others.—Mr. W. T. T. Dyer exhibited several interesting vegetable economic products, and made remarks thereon. Of a species of wax extracted by Mr. D. Morris, of Jamaica, from *Myrica microcarpa*, it was stated that while the berries are used for obtaining wax in South Africa, the West Indian fruits had not hitherto been used for this purpose. Of a grey camphor-like substance, the product of *Artemisia Moxa*, he mentioned such to be a rare example among the Compositæ; and there was a probability that this camphor was that used in the production of Indian ink by the Chinese, and which gave the peculiar aromatic odour to the true China ink. A Rosary made of fruits of *Trapa verbanensis* de Not. (locally called Frutti de Lago) from the Lago di Varese, Italy, had been purchased for one franc; specimen of wax and candles made from *Rhus vernicifera* of Japan; the latter preparation is quite a local industry which unfortunately is now ceasing on account of the rivalry of the cheap American oils.—A paper was read by Mr. R. A. Rolfe, of Kew, "On the Selagineæ described by Linnæus, Bergius, Linnæus fil., and Thunberg." In working up a monograph of this neglected order it has been found that the species of the early writers have been entirely misunderstood. This has partly arisen from the imperfect descriptions and absence of authentic specimens; likewise from certain species being excessively local leading to wrong names being applied;—thus *Hebenstreitia dentata* L., and *Selago fruticosa* L. were unknown to Thunberg, though he applied the names to very different plants; and other instances similar in kind could be mentioned. The author has adopted a chronological order in treating of his subject as being most convenient. He has noted the condition of the original specimens preserved in herbaria, and what has been done with each by the later writers. Choisy's monograph in the 12th volume of De Candolle's 'Prodromus' (1848) is taken as the latest revision of the order. The Selagineæ of Bergius in Stockholm, of Thunberg's in Upsala, and of Choisy's types in Berlin, have kindly been placed at the author's disposal by Professors Warming, Fries, and Eichler, and a careful comparison been made of all the specimens in the herbaria of the British Museum and Kew, some of the old types in the former collection being especially interesting.—The following paper was taken as read: "Notes on some new economic products recently received at the Royal Gardens, Kew," by Mr. W. T. T. Dyer.

West Newman & Co imp.

1. Erigeron Darrellianus *Hemsl.* 2. Carex bermudiana *Hemsl.*

BERMUDA PLANTS IN THE SLOANE COLLECTION, BRITISH MUSEUM.

By W. Botting Hemsley, A.L.S.

(Plate 239).

Since writing the descriptions of two new Bermudan plants published at p. 104, an article on the scope of the forthcoming volume on the Botany of the 'Challenger' Expedition,* and other articles† on the vegetation of the Bermudas and the Bermuda Cedar, I have more fully studied the flora of the islands, and the result is a considerable modification of my views respecting the endemic element. The number of apparently endemic species now known is still small: yet one at least, a palm, is a conspicuous feature in the vegetation. When I wrote the article on the Cedar, my opinion, based upon the fact that no wild specimens of it from any other country existed in the general herbaria at Kew and the British Museum, was that it was endemic. The only specimen in the General Herbarium at the British Museum from the West Indies is from Antigua, and was collected by De Ponthieu, who wrote the following memorandum on his label:—"Brought here from the Bermudas, and not common." This, together with the fact that all the specimens of Cedar in the two herbaria from the West Indies are the Red Cedar, *Juniperus virginiana*, and not the Bermuda Cedar, *J. bermudiana*, seemed to justify such a conclusion. Nevertheless the Bermuda Cedar is not endemic, as I am able to show through the kindness of Mr. Carruthers and Mr. Britten, who took the trouble to look up in the Sloane Collection not only the original specimens of Juniper described and figured by Plukenet, Petiver, and Sloane, but also all the Bermuda plants which form the subject of this paper. The existence of *Juniperus bermudiana* in Jamaica has quite lately been confirmed by a parcel of Juniper-berries sent to Sir J. D. Hooker.

The Bermuda plants in the Sloane Collection are only seven in number, yet among them are my *Erigeron Darrellianus* (see p. 104) and a species of *Carex* (H. S. xxxii. (Herb. Sloan. xxxii. 81) 83) hitherto undescribed; the others being *Sisyrinchium Bermudiana* (H. S. clix. 3), *Verbena urticifolia* (H. S. clix. 47: "a strong emetick"), *Melilotus parviflora* (H. S. xxxii. 83), *Erigeron canadense* (H. S. cclxiv. 3), and *E. linifolius?* (H. S. xxxii. 81). There is also a leaf, apparently of a Composite (H. S. xxxii. 80), labelled "Eupatorium Bermudense latifolium flosculis pallescentibus, *Silverweed* nostratibus vulgo, Pluk. Tab. 243, fig. 2. An Conyza urticifol. Sl. Jam. 124," which we have not been able to identify, either from the specimen or from Plukenet's

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* 'Nature,' March 15, 1883, p. 462.

† 'Gardeners' Chronicle,' n. s., xix., pp. 367, 431, 656.

figure.* These plants were collected by a Mr. J. Dickinson† about 1699, and are, we believe, the oldest specimens of the vegetation of the islands in existence. In the narratives of the early voyagers we find records of a Palm, a Cedar (*Juniperus*), Prickly Pear (*Opuntia*), and a few other plants; but F. A. Michaux was the first botanist who visited the islands and published an account‡ of the plants. He particularly mentions the Palm (a species of *Sabal*), the Juniper, and *Rhus Toxicodendron* among the indigenous plants; and he enumerates the following European plants as being so common as to have all the appearance of being indigenous:—*Verbascum Thapsus*, *Anagallis arvensis*, *Mercurialis annua*, *Leontodon Taraxacum*, *Plantago major*, *Urtica urens*, *Medicago* sp., *Gentiana nana*, and *Oxalis Acetosella*. The two last should probably have been *Erythræa* and *Oxalis corniculata*.

But to return to Dickinson's plants. It will be seen that, besides *Erigeron Darrellianus* and the *Carex*, he collected one other plant that has a claim to be regarded as indigenous, namely, *Sisyrinchium Bermudiana*. Michaux, it is true, does not mention it; but he being a prisoner of war on board an English man-of-war, had only, through the kindness of the commander, opportunities for two or three short walks. It is now spread all over the islands, and is one of the commoner flowering plants. Its claim to be regarded indigenous rests upon the fact that the variety found in the islands is distinct from the various forms of the species widely spread in North America. According to Baker,§ it is the *S. iridioides* of Curtis (Bot. Mag. t. 94), figured by Dillenius‖ under Tournefort's designation *Bermudiana iridis folio radice fibrosa*. This variety is taller and more robust than the others. Most likely the species was originally conveyed to the islands, perhaps by seed in the mud sticking to the claws of a marsh-bird. Certainly it is a good colonist in many countries, multiplying and spreading at a rapid rate. It has established itself in various parts of South America, Mauritius, and Australia; and in New Zealand,

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* [This we have since identified with *Eupatorium macrophyllum* L. In H. S. xxxii. 80 there are only leaves; but in H. S. xcvi. 28 is a flowering branch with a reference to Pluk. 243, 2, to which figure the same name is attached as that cited from Herb. Sloan. On fol. 29 of the last-named volume is a specimen of *Erigeron Darrellianus*, from which Plukenet's figure (243, 3) may have been taken. This vol. (xcvi.) is one of four forming "an Herbarium of Dried Plants, collected by Dr. Plukenet from all Parts, amongst which are rare plants gathered in the Canaries, Madeira, &c."; the individual specimens being for the most part neither named nor localised. It seems probable that these specimens formed part of the collections received from the Bermudas by Petiver, and were sent by him to Plukenet.—Ed. Journ. Bot.]

† [Petiver (Mus. Pet. cent. viii., p. 80, dated Dec. 31, 1700) thus refers to him:—"To Mr. John Dickinson I am obliged for some Plants he lately sent me from Bermudas (besides 2 Collections some Years agoe) with assurances of larger performances"; and at p. 75 (no. 779), speaking of *Juniperus bermudiana*, he says, "The Cedar of Bermuda's, From whence my Kind Friend Mr. John Dickinson sent it me in Berry."—Ed. Journ. Bot.]

‡ Ann. Mus. Hist. Nat. Paris, viii., p. 356 (1806).

§ Journ. Linn. Soc., xvi., p. 117.

‖ 'Hortus Elthamensis,' p. 48, t. 41, fig. 48 (1732).

on the authority of Dr. Hector, it is common on the hills near Wellington, where it forms a considerable part of the pasture, and is greatly relished by cows, yet able to maintain its ground and even to continue to spread. The same species, it will be remembered, has been found in a wild state in several places in Ireland, though how it reached there is uncertain.

As already stated, the Sloane Collection contains specimens of *Juniperus bermudiana* from the West Indies.* The original *J. bermudiana* was founded by Hermann† on a juvenile or sterile state raised from seed received from England, and reported as coming from the Bermudas. All the evidence goes to show that Parlatore‡ has given the correct synonymy of the species, and that he was right in regarding it as distinct from *J. virginiana*. The accompanying woodcuts, kindly lent for reproduction by the editor of the 'Gardeners' Chronicle,' give a very good idea of the characteristics of *J. bermudiana*, as well as the differences in the foliage of *J. virginiana*. The latter has much slenderer ultimate branchlets, smaller, more acute leaves, with a distinctly resinous gland on the bark; and there appear to be very good distinctive characters in the fruits and seeds of the two species; but these I have not yet been able to compare fully. Sloane's specimens of *J. bermudiana* are from Jamaica,§ the Barbadoes and English gardens; none from the Bermudas.

Erigeron Darrellianus‖ (Tab. nostr. 259, fig. 1) is called "Hen Hogweed" on Dickinson's label in the Sloane Collection—"it grows amongst bushes and flowers in February and March": and there is a second species of *Erigeron*, perhaps *E. linifolius*, on the same sheet and from the same country, named "Hogweed" simply. Which of these two is intended by Plukenet¶ under the designation *Eupatorium angustiorifolio Bermudense*, &c., is uncertain: the figure is not a good representation of either.

The *Carex* is the most interesting plant in this collection, being the only specimen of the genus I have seen from the Bermudas.

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* [H. S. clxxxiy. 3, labelled "Bermudas Savin or Cypresse. Pl. 197, 4." This volume contains the "Arbores Barbadenses & Jamaicensis of Mr. Petiver," some being further specified as "very bad specimens of Barbadoes trees gathered by Mr. Read." Plukenet's figure ('Phytographia,' t. 197, 4) is lettered "Juniperus Barbadensis, Cupressi folio, ramulis quadratis. Savin or Cypresse tree, nostratibus dicta, ab honesto viro Jacobo Reede, in Insulâ Barbados collectum & siccatum nos accepimus"; and this seems to have been taken from a specimen in H. S. xcvi. 121, confirming the suggestion at p. 257 (footnote) that the plants in these volumes of Plukenet were sent to him by Petiver.—Ed. Journ. Bot.]

† Hort. Acad. Lugd. Bat. Cat., p. 345, with figure.

‡ DeCandolle's 'Prodromus,' xvi., pars 2, p. 491.

§ [Sloane has in his own Jamaica collections both *J. virginiana* (H. S. v. 51) and *J. bermudiana* (H. S. v. 52), the latter having appended to it the remark "præcedentis varietas?" His description (Nat. Hist. Jamaica, ii. 2) may include both: the wood, he says, is "extremely like, if not the same with the Bermudas Cedar."—Ed. Journ. Bot.]

‖ [There is also a specimen at the British Museum, collected by the Rev. R. Hunter, and labelled by him, "Found on the sea-coast in the parish of Paget, Bermuda, Feb., 1844."—Ed. Journ. Bot.]

¶ 'Phytographia,' t. 243, fig. 3.

It is very closely allied to the endemic St. Helena *C. prælta* Boott.*; but it is much slenderer, and probably not more than half as tall. All the spikelets in our plant are sessile or subsessile, and the bracts are narrower; and the glumes and utricules are dotted as in *C. æquabilis*, another species endemic in St. Helena. It seems, however, to be an undescribed species. There are two culms, the large one bearing five spikelets in a rather advanced state, and two leaves. The glumes and fruit have fallen away from the lower half of the lowermost spike.

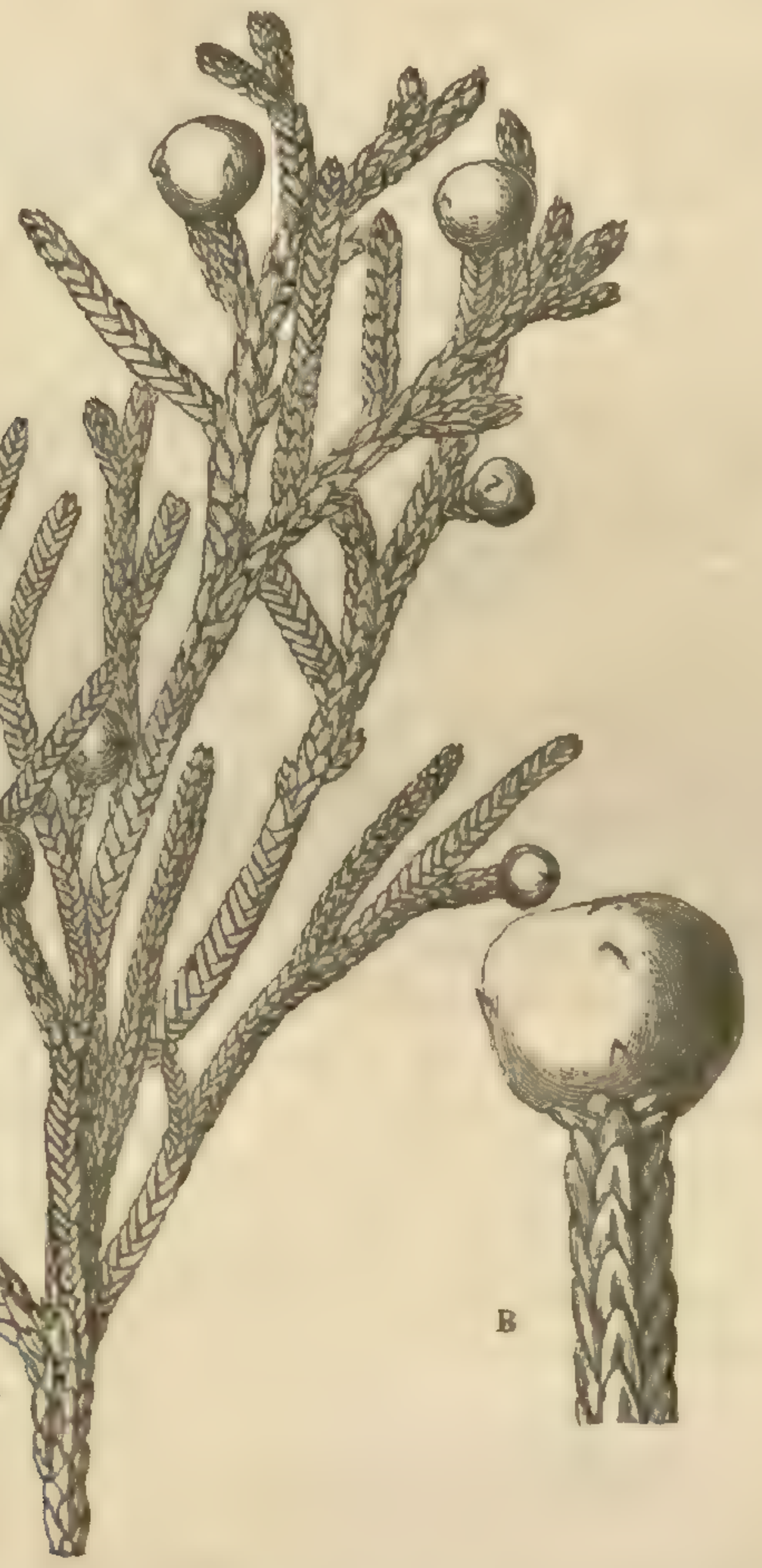
Juniperus bermudiana. — A, Branchlet of adult male plant. B, Branchlet of young plant. C, Male flower-spike × 3. D, Adult leaf × 8. E, Male spike of *J. virginiana* × 3. F, Adult leaf of same × 8.

Carex bermudiana, n. sp. — Gracilis, glabra, ultra pedalis. Culmus 5-spicatus. Folia circiter 2 lineas lata, vix scabrida. Bractea infima deest, proxima superior filiformis culmum paulo superans. Spicæ sessiles vel subsessiles, cylindricæ, 3 inferiores fœmineæ, intermedia basi fœminea apice mascula, 2 superiores masculæ; glumæ ovatæ, breviter aristatæ, punctatæ, vix hispidulæ. Perigynium longiuscule acuminatum, bifidum, costatum, undique

* Illustr. Genus Carex, i., p. 66, tt. 179 & 180.

fere glabrum. Styli 3. Nux breviter stipitata, subtrigona, lævis, glabra. — 'Gram. Cyp.. Bermud. tenuis spicatum. A Bermud. a D. Dickinson.' Herb. Sloan. xxxii. 83. Tab. nostr. 259, fig. 2.

I was at one time disposed to believe it probable that not a single species of plant had been lost to the islands since they were settled; but the discovery of this *Carex*, which nobody, so far as I know, has collected since Dickinson, and various other circumstances lead me now to a contrary conclusion. A very obvious fact is the great rarity of a large proportion of the indigenous species.



Juniperus bermudiana.—A, Branch of female plant. B, Fruit × 2½.

Dr. J. Rein's list of the flowering plants and ferns collected by himself in the islands, and which he seems to have regarded as tolerably complete, contains only 128 species, fifty of which at least are doubtless introduced plants. My list comprises about 130 indigenous species, besides about fifty others that may have reached the islands independently of the agency of man. In addition there are about 130 certainly introduced species. Many of the species that are in one collection do not occur in any other; and it is very probable that a botanist would find a number of additional species in the marshes.

ARUM MACULATUM AND ITS CROSS-FERTILIZATION.

By Robert Miller Christy and Henry Corder.

(Concluded from p. 240).

The powerful scent or the brightly-coloured spadix attract large numbers of a small species of fly,* which, after remaining for a moment on the inner surface of the spathe, fly down into the bulb, where they remain fast prisoners, securely shut in by the hairs at the mouth, which by pointing slightly downwards admit of their entrance but not of their exit. The number of these flies thus caught is very variable in different flowers, but is often remarkably large. We have both repeatedly opened spathes in which were fifty at least, and often far more; for instance, among others, we have opened some which we have estimated to contain 70, 100, 100, 150, and 230 flies. On the 1st of May, 1882, we found a large spathe during the morning, with the spadix cold and pollen shed, in which we actually counted no less than 365 live flies and 12 dead ones, or 377 in all, the vast majority of which were of one species. In another spathe we found 45 living and 53 dead flies. At first thought it seems difficult to say where such large numbers of these usually unnoticed insects can come from; but they are so minute that they are very easily overlooked, and a few may generally be seen about near large numbers of Arums. This species seems to be the only one which habitually frequents the flowers of *A. maculatum*; but most spathes contain one or two insects of other sorts which have most likely got in by accident, such as small beetles, weevils, tiny flies, and other insects. In more than one case we have observed dung-flies on the spathes, but these are probably too large to enter. We have also noticed that slugs (*Limax agrestis*) and spiders sometimes enter the bulb of the spathe—the former probably for shelter and the latter possibly for the flies. The heat and smell seldom last more than a few hours—we believe about six or seven, or perhaps less. Mr. Britten has kindly drawn our attention to a note in the 'Phytologist'† in which Mr. G. B. Wollaston records that his little boy was picking

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* H. Müller, in his 'Fertilisation of Flowers' (see Thompson's English translation, p. 562), states that the only insect he has found within the spathe of *Arum maculatum* is the small dipter, *Psychodia phalænoides*, and that in great quantities; while Delpino has observed *A. italicum* to be fertilized by six different flies belonging to the genera *Ceratopogon*, *Chironomus*, *Sciara*, *Psychoda*, *Limosina*, and *Drosophila*. He thus describes the process of fertilisation:—"In the first stage of flowering the stigmas only, which are borne by the base of the spadix, are mature; a foul ammoniacal smell attracts the Psychodæ into the prison, where they cross-fertilise the stigmas if they have come from other plants. In the second stage the stigmatic papillæ wither, and a drop of honey appears in the middle of each stigma. In the third stage the anthers dehisce, and the greater part of their pollen falls upon the floor of the chamber; the insects dust themselves over and over with it, and finally, when the palisade of hairs withers in the fourth period, they pass out, and enter another flower in its first stage."—A. W. B.

† 'Phytologist,' 1857, N. S, ii., pp. 45, 46.

Arums at Chiselhurst, and brought him one, exclaiming, "This thing in the middle is quite hot." He continues—"Finding that the warmth continued the whole of that and part of the next day, I tested it by applying both the spadix and spathe to the bulb of a good thermometer, and found that the clubby portion of the spadix was 71° Fahr.. whilst the spathe only 57½°, making a difference of 13½°." A spathe seems to catch its full complement of flies very quickly—indeed they begin to enter as soon as ever the spathe is unrolled, and often before that operation is complete. As it seems probable that they are attracted by the scent, perhaps assisted by the spadix (Sir John Lubbock makes no mention of the heat or smell, but says they enter "attracted by the showy central spadix, the prospect of shelter or of honey"), it follows that they must all be caught within a very short space of time.

The imprisoned flies have probably (as will hereafter be shown) brought pollen from some other Arum, which they are sure to deposit on the brushes of the stigmas whilst crawling about them and in the bottom of the bulb, up the sides of which they are unable to climb, and thus the cross-fertilization of the plant is accomplished. These flies are peculiarly adapted for the carriage of pollen, having very hairy bodies and wings; so that under the microscope they may often be seen to be covered with it.

Very shortly after the fertilization of the ovules the ovaries may already be observed to have begun to swell—even, we believe, before the pollen is shed. They very quickly lose the brush of short hairs from their tips, and its place is afterwards occupied by a small round hole. The ovules are now of course incapable of receiving any further fertilization, having received the great advantage of crossing; and hereafter we shall give reasons for believing that this species has lost the power of self-fertilization. At this stage a minute drop of liquid exudes from the hole in the tip of each ovary, and as we have sometimes seen flies greedily devouring this it is probably of the nature of nectar. Shortly after this the anthers ripen, and as they burst the pollen is thrown down in abundance upon the flies, which, from being utterly unable to climb the extremely smooth sloping sides of the interior of the bulb, are compelled to congregate together in a heap at the bottom or on the ovaries (which they are able to ascend with difficulty), being in either case in a position in which the pollen must necessarily fall on them; and as a matter of fact they may be seen to be covered with it. We do not know any use for the lower circle of hairs, which are always more or less rudimentary, unless they are-to prevent the flies climbing up to the anthers and the space above them, where they would not receive the shower of pollen. After this the filaments blocking the entrance to the bulb shrivel up, and the flies, escaping, carry the pollen away to some other recently-opened strong-smelling spathe, and, after fertilizing, its ovules go through exactly the same adventures as have already been described, being in the end dusted with fresh pollen,

which, after again escaping, they perhaps carry to yet another flower.*

According to Darwin, Fabricius and Sprengel both state that flies do not again escape from the flowers of *Aristolochia* when they have once entered; but this is obviously absurd, as in that case they could not possibly assist in the cross-fertilization. It is perfectly certain that the majority of flies do escape, *but it is equally certain that all do not do so*. The following very keen observation is given by Darwin.† He says:—"On examining several spathes [of *A. maculatum*], from thirty to sixty minute Diptera belonging to three species were found in some of them; and many of these insects were lying dead at the bottom, as if they had been permanently entrapped. In order to discover whether the living ones could escape and carry pollen to another plant, I tied, in the spring of 1842, a fine muslin bag tightly round a spathe, and on returning in an hour's time several little flies were crawling about on the inner surface of the bag. I then gathered a spathe, and breathed hard into it; several flies crawled out, and all without exception were dusted with Arum pollen. These flies quickly flew away, and I distinctly saw three of them fly to another plant about a yard off; they alighted on the inner or concave surface of the spathe, and suddenly flew down into the flower. I then opened this flower, and although not a single anther had burst, several grains of pollen were lying at the bottom, which must have been brought by one of these flies or some other insect. In another flower little flies were crawling about, and I saw them leave pollen on the stigmas." That some of the flies should die thus in the flower seems very strange, and suggests the idea that the plant may have some other object, besides its cross-fertilization, in view in thus entrapping the flies; for it seems certain that every fly that dies in a flower lessens the chance of fertilization of all the neighbouring flowers, which would be prejudicial to the welfare of the species. It is hard to say exactly what is the immediate cause of their death, but we do not ever remember to have noticed dead flies in any flower before the heat and smell had gone off; most appear to die about the time of the secretion of the nectar, and certainly they often do so before the shedding of the pollen. On the evening of April 12th, 1882, Mr. Christy opened two flowers, both of which were devoid of heat or smell, but the pollen was not shed. One contained about one hundred live flies, and the other thirty live and two dead ones. Another flower, rather more advanced and with all the pollen shed,

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* It seems, from a note kindly sent us by Mr. Bennett, that G. Kraus has tested the elevation of temperature, &c., in *Arum italicum*, and found that a thermometer placed in the midst of five opening spathes rose from 17·7° to 44·7° C. The heating commenced at the apex of the spadix, where it was most considerable, and proceeded downwards. The rise of temperature in the anther takes place much later, and is less considerable; the stigmas experience no rise at all. It would be interesting to compare the description of the means of fertilization of *Arum maculatum*, as given above, with the description of that of *Aristolochia Clematitis*, as given by Mr. Bennett (Pop. Sci. Rev. April, 1875, p. 113).

† 'Cross and Self-Fertilization of Flowers,' p. 417.

contained two live flies, and eight or ten dead ones lying at the bottom covered with pollen. Most Arum flowers kill a few flies, and these may of course be found in them after the rest have escaped; but some kill far more than others, and a few we have noticed have apparently killed all, as they contained sometimes as many as one hundred dead.

It seems to us rather like a piece of gratuitous kindness on the part of the Arum for it to secrete a drop of nectar for the flies just before their departure, "thus repaying the insects for their captivity," as Sir John Lubbock says; for the flies can hardly enter the spathes for the sake of this honey, as it does not exist when they do so. The plant, presumably, catches the insects by its odour, and therefore secures all it requires (supposing that it wants nothing but fertilization); and no one will imagine that it entertains feelings of such considerate kindness towards the insects as to pay them for their services which it must by this time be aware (so to speak) that it can obtain equally well without payment. It may be, however, that during their captivity the insects require food, and the plant has to feed them to secure its own ends. But if cold weather were to intervene, the secretion of the nectar would probably be retarded, and thus some of the insects might starve. The fact, however, that *most* Arums kill some flies makes one think that they must have a definite object in so doing. We do not wish to state our belief that this object is the obtaining of nutriment from the bodies of the dead flies, but an observation which Mr. Christy has made formerly led us to believe that this might *possibly* be the object. He has frequently seen dead flies stuck to the tips of the ovaries after the rest had all escaped, and on several of these occasions he has plainly observed that these flies' bodies had been by some means or other drawn partly into the hole at the tip. Sometimes the wings of the flies have been drawn by their tips nearly half into one of these holes, and on one occasion he has seen one wing of a fly drawn into the tip of one of these ovaries, whilst the other wing was drawn into the tip of an adjoining one with such force that the right wing had been torn from the body. This might, however, have been accomplished by the swelling and consequent growing apart of the two ovaries rather than by suction.

With these facts before us we asked ourselves whether it could be that Arum was insectivorous, and, if not, on what other supposition could we account for the foregoing evidence? Being unable to answer these questions, we applied to Mr. A. W. Bennett, who has taken a very kind interest in our observations. His reply was as follows:—"I have examined under the microscope several of the specimens of Arum you have been kind enough to send me, but find no evidence of any absorption or digestion of insects. The spot at the apex of the ovary is the stigmatic opening, there being no style; this opening is fringed with hairs, which are evidently the stigmatic hairs, and have for their function the excitement of the emission of the pollen tubes and the conduction of these to the ovules. The interior of the

ovary is also clothed with hairs. The insect to which you called my attention had been caught and retained by these hairs; but I cannot discover any evidence that the capture of insects is any function of these hairs, or that there are any absorptive or digestive glands in the substance of the ovule. I have, however, preserved several specimens in alcohol for careful examination when I am rather more at leisure." Mr. Bennett has further been kind enough to send us an extract from the Italian Journal of Botany,* to the effect that G. Arcangeli has observed the rise of temperature, &c., in several species of *Araceæ*, but does not consider that there is sufficient evidence to warrant the assumption of carnivorous habits in these plants, there being a complete absence of any digestive fluid and of any special digestive glands in the spathe. Under all the circumstances, it seems as if some other explanation than that of carnivorousness would have to be sought for.

After the escape of the flies the spathe very quickly begins to wither, and we believe that very few last more than twenty-four hours; so that the plant spends many weeks in producing what, when mature, it only uses for a few hours, which may be cited as an example of the extreme care exercised by plants to ensure the production of offspring. The ovaries rapidly swell and continue growing until, about the end of June, they reach the size of large peas, and burst the dry withered bulb of the spathe. These ovaries contain either two or three seeds each, and they remain on the erect flower-stalk till the autumn, when they turn to a bright vermilion-colour and form the conspicuous objects which are so often seen in hedge-bottoms after the leaves have fallen. At the beginning of winter the rotting of the base of the stalk causes it to fall to the ground, when the berries become detached. We have never yet detected any bird eating these berries, but, judging from their attractive colour, it is probable that they are habitually eaten by some species. The leaves last sufficiently long to enable the root to lay in a store of nutritious matter for use in the following spring, but before midsummer they have often so completely rotted away as to be scarcely discoverable in places where, a few months earlier, they were abundant.

In spite of all these precautions for ensuring the production of seed, it seems to us quite certain that the number of plants producing scarlet berries in the autumn bears but a small proportion to those which produce spathes in the spring, though we do not know what the cause of this may be. At any rate it seems, from Mr. Christy's observation, that the plant is so strongly proterogynous as to be quite incapable of self-fertilization. He covered four spathes with a net before they opened on April 28th, 1882, and all died without setting seed; but, as others growing near them did the same, it may have been from some other cause than that of non-cross-fertilization. In like manner two from which, before opening, he removed the spadices, both died; but two from which, before ripening, he removed the anthers, and one

* Nuov. Giorn. Bot. Ital., xv. (1882), pp. 72—97.

from which, before opening, he removed the filaments, all set plenty of seed.

On the 26th of May, 1881, Mr. Christy found a most curious variety of the flower in Debden Park, Essex. The external appearance was exactly as usual, as also was the spadix, which was of a deep red-purple. On opening the spathe the floral organs were all found to be normal, except that no less than seven of the ovaries were themselves developing into small spadices of the same colour as the large one. Five of them, of which the largest was about half an inch, were perfect, and had small filaments round their bases. The other two were merely small coloured tubercles on the ends of two ovaries. Altogether this spathe contained eight more or less perfect spadices. Another monstrosity which we gathered on May 1st, 1882, had only two ovaries, one or two anthers, and a very short spadix.

With regard to the great heat given out by the spadix during the maturity of the stigmas, there can, we think, be no doubt that chemical action of some sort is at the root of the matter. Our friend Mr. J. E. Clark, of York, writes that it is most probably due to the slow process of oxidation which goes on day and night in the flowers of plants. "It is," he says, "very natural that such heat should be further utilized in the production of a peculiar scent." Mr. Bennett has observed of the spadix that "its cells are full of starch, and each contains an evident nucleus." There can be no doubt that to sustain a heat and smell such as have been described must require some pretty powerful chemical action; hence doubtless the large amount of material to be found in the club at this period. But when the heat is once over, the club is no longer required, and very quickly withers and dries up; and as the ovaries are at this period growing at a great rate, it seems probable that they may draw their sustenance from the now useless spadix as from a reservoir.

HEPTADEM FILICUM NOVARUM SINICARUM

porrigit Henr. F. Hance, Ph.D., &c.

1. **Blechnum Hancockii**, sp. nov. — Rhizomate parvo paleis ferrugineis linearibus acuminatis tecto, foliis cæspitosis petiolo subnullo sterilium lamina 8-pollicari crassiuscula coriacea opaca lanceolata pinnatisecta segmentis utrinque circ. 30 pollicem longis 2–2½ lin. latis basi lata adnatis basi superiore producta integerrimis falcatis obtusiusculis infimis sensim deminutis fertilium lamina 7–8 pollicari segmentis infimis remotis abbreviatis superioribus approximatis linearibus obtusis 8–10 lin. longis 1¼ lin. latis, indusio intramarginali membranaceo fornicato soros obtegente.

In rupibus apertis montis olim ignivomi nunc exstincti Huang-kong, juxta Tam-sui, insulæ Formosæ, alt. 3300 ped. rarissimum, nec alibi, coll. W. Hancock, d. 27 Nov. 1881. (Herb. propr. n. 22183.)

1141

2. **Blechnum stenopterum,** sp. nov. — Rhizomate parvo epaleaceo, foliis cæspitosis petiolo sterilium 4–5 fertilium 8-pollicari angulato per totam longitudinem alula ½ lin. lata marginato sterilium lamina 5–8 pollicari membranacea subpellucida glaberrima lanceolata pinnatisecta segmentis utrinque circ. 20 ad 22 lin. longis 4 lin. latis basi lata adnatis basi superiore leviter v. vix producta rectis acutis margine serratis infimis abbreviatis rotundatis nervis tenuibus conspicuis simplicibus v. semel furcatis fertilium lamina 5–6 poll. longa segmentis linearibus acuminatis 15–18 lin. longis lineam latis, indusio submarginali membranaceo soros demum nudante.

In ejusdem montis ac præcedens, rupibus nebulis imbribusque obnoxiis, obvenit am. W. Hancock, m. Nov. 1881. (Herb. propr. n. 22189.)

Filicibus hisce duabus cum *B. orientalis* Sw. forma typica, varietatibusque *japonica* Hook. ac *blechnoidi* Bak. sedulo comparatis, simulque perpensis cl. Franchet observationibus,* eas sinceras esse species nullus dubito. *Blechno*, præeunte b. Mettenio,† *Lomariam* subicio, firmis, hercle, inter genera a plerisque recepta, deficientibus discriminibus.

1274 3. **Micropodium cardiophyllum,** sp. nov. — Rhizomate teneri repente minute setuloso, foliorum distantium petiolo nitide ebeneo sulcato 7 poll. longo e phyllopodio brevissimo demum secedente lamina membranacea glaberrima utrinque opaca subtus paulo pallidiori cordato-ovata acuminata margine leviter undulata sinu angusto 7 lin. alto lobis basalibus rotundatis 4½–5 poll. longa 2¾–3 poll. lata costa subtus parum prominula ad duas tertias longitudinis ebenea dein viridi evanescente nervis excurvis parallele furcatis marginem versus parce anastomosantibus areolas paucas oblongas efformantibus, soris Asplenioideis totam folii longitudinem occupantibus a costa 2–3 lineas a margine 4-6 lin. distantibus, indusio membranaceo pallido.

Ad pagum Shui-tan, dicionis indigenarum "Lai," ins. Hai-nan, d. 20 Nov. 1882, leg. rev. B. C. Henry. (Herb. propr. n. 22153.)

Gregem adhuc perpaucos complectentem cives lætus specie hac lepida et sane distinctissima locupleto. Resputum ab amplissimo Baker genus, ex mea sententia optime distinctum.

1254 4. **Aspidium exile,** sp. nov.—Rhizomate . . . . ?, foliis teneris flaccidis petiolo ferrugineo cum pagina inferiore paleis pallide ferrugineis linearibus exquisite attenuatis ad 3–4 lin. longis dense vestitis laminæ 9 poll. longæ pyramidatæ lanceolatæ subtripinnatisectæ siccitate nigricantis supra glaberrimæ segmentis primariis circ. 13–15 4–5 poll. longis ¾–1 poll. latis breviter petiolatis linearibus erectiusculis incurvis apice attenuatis secundariis utrinque 20–30 2½–4 lin. longis infimis longioribus iterum pinnatisectis inferioribus remotiusculis superioribus approximatis breviter petiolatis e basi inferiore cuneata superiore truncata auriculata oblongis subfalcatis margine utroque antice magis

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* Enum. pl. jap. ii. 217.

† Fil. hort. bot. Lips. 60.

distincte lobulatis lobulis apice rotundatis spinuloso-mucronatis nervis simpliciter furcatis, soris copiosis medio inter costulam et marginem sitis, indusio orbiculari sinu angusto clauso reniformi pallide ferrugineo centro nigro affixo.

In vicinia urbis Wen-chau, prov. Che-kiang, coll. cl. W. G. Stronach. (Herb. propr. n. 22187.)

Filicula ab omnibus *Aspidiis* mihi notis probe diversa, inter Polystichoideas eleutherophlebias statuenda. Est aliquantulo quasi *A. Braunii*, magis decompositum ac ramosum, simulque valde imminutum et textu tenue. Teneo tantum exemplar singulare, mancum.

5. **Aspidium festinum,** sp. nov. — Rhizomate . . . . ?, petiolo stramineo cum rachi sulcato paleis paucis lanceolatis acuminatissimis pallide cinnamomeis consito, lamina 1½-pedali ovato-lanceolata acuminata sub-4-pinnatisecta lætevirenti glaberrima glandulis utrinque destituta segmentis primariis utrinque circ. 14 petiolatis lanceolatis acuminatis secundariis petiolatis omnibus anadromis in infimis tantum segmentis primariis latere inferiore adauctis basi bi- tri- sursum sensim semel pinnatisectis laciniis oblique ovatis pauciserratis acutis venas simpliciter furcatas inconspicuas excipientibus omnibus 3–4 soros gerentibus, indusio reniformi subplano semilineam diametro subaurantiaco glandulis paucis brevissime stipitatis ciliatis.

In jugo Lo-fau-shan, prov. Cantonensis, m. Sept. 1882, coll. rev. E. Faber. (Herb. propr. n. 22146.)

Filix elegantissima, ex agmine *A. æmuli* Sw.!, *A. Forbesii* Hance!, *A. glabri* Mett.!, et *A. crenati* Willd.!; ab omnibus foliorum incisura diversum; huic, fortasse, neglecta glabritate, proximum.

6. **Polypodium hemitomum,** sp. nov. — Rhizomate tenui repente paleis lanceolatis ferrugineis clathratis tectis radiculas fulvo-pilosas edentibus, foliis membranaceis glaberrimis ambitu triangulato-lanceolatis 7 poll. longis in petiolum 4–5 pollicarem per dimidiam fere longitudinem alatum angustatis basi 7 poll. latis ad trientem longitudinis utrinque laciniis 5–6 approximatis lanceolatis præditis lobo terminali integro margine undulato nervis utrinque prominulis lobis costulatis costulis in parte folii terminali indivisa nullis areolis pluriseriatis nervulis plerumque 2 liberis præditis.

In nemore juxta Fuk-shan-mun, secus fl. Lien-chau, prov. Cantonensis, circ. 320 m. p. a metropoli, m. Oct. 1881, leg. rev. B. C. Henry. (Herb. propr. n. 22104.)

Filix facie singularis, imprimis, ut videtur, *P. affini* Bl., *P. insigni* Bl., et *P. dilatato* Wall. cognata. Folia sterilia tantum possideo.

7. **Polypodium polydactylon,** sp. nov. — Rhizomate abbreviato radiculas ferrugineo-tomentosas edente paleis lanceolatis integerrimis pallide brunneis acuminatis apicem versus pilosis 2–3 lin. longis vestito, petiolo brunneo-ebeneo 4–9 pollicari inferne tetragono inter angulos sulcato apice complanato, foliis crasse coriaceis 4–5 poll. longis e basi longe excurvato-cuneata ambitu orbiculatis pedatipartitis lobo medio simplici lateralibus margine

superiore 3–4-partitis segmentis sursum spectantibus linearibus acutis v. obtusis 6–7 lin. latis supra glabris foveolis minimis impressis notatis subtus panno ex albo fulventi e setis stellatis 6–10-radiis medio aureo-glandulosis conflatis dense obsitis costa supra impressa subtus parum elevata palmatim ramosa singulum segmentum percurrente nervatione Cyrtophlebii absque maceratione haudquaquam perspicienda, soris inter costulas 3–4-seriatis inter costam et marginem circ. 10-seriatis e foveolis plus minus emersis.

In rupibus montis olim ignivomi nunc exstincti Ta-tun, 5 m. p. ab oppidulo Tam-sui ins. Formosæ inter septentriones et orientem siti, d. 16 Apr. 1882, rarissimum vigens detexit W. Hancock. (Herb. propr. n. 22168.)

Filix magnifica, *P. tricuspidi* Sw. imprimis affinis. Persuasum est mihi *Niphobolos*, justis circumscriptos limitibus, in posterum genericam accepturos esse dignitatem. Vastissima *Polypodiorum* turma, qualis hodie a plerisque intellegitur botanicis, greges specierum plures includit, nequaquam veræ cognationis vinculo collectos, sed lege mere artificiali (characteribus ex organis vegetativis desumptis omnino spretis), consociatos. Profecto, me judice, totum systema filicum funditus denuo exstrui oportet; quo in conamine, ni fallor, jampridem desudat vir strenuus Maximilianus Kuhn. Interea, plantam insignem, vestigia b. Mettenii persequutus, hic relinquo.

ONCIDIUM FLABELLIFERUM Pinel.=*O. GARDNERI* Ldl.

By H. G. Reichenbach, fil.

I have just noticed that M. Barbusa Rodriguez (G. & Sp. ii. 191) makes the following statements:—"Cette espèce, trouvée à Novo Friburgo, par feu M. Pinel, horticulteur français, à été donnée par le savant professeur Reichenbach fils, comme synonyme de l'*O. pubes* Lindl.,* mais je crois que par mégarde au [*sic!*] confusion. Naturellement l'exemplaire examiné par ce professeur à été remis entre ses mains avec un nom que ne lui appartenait pas, car l'espèce en question est très différente de celle de Lindley, nom [*sic*] seulement dans la forme et grandeur des pseudobulbes, que dans la panicule et dans le couleur et grandeur des fleurs. Il suffit de dire que le *flabelliforme* [*sic*] appartient à le section Tetrapetala § macropetala de Lindley, tardis que l'autre à la section Tetrapetala § micropetala." "Ils sont entièrement différent même dans le facies de la plante; l'espèce de Lindley à le facies d'un *O. sarcodes* Lindley, et l'autre d'un *O. crispum* Lodd."

I have given this remark in Walpers iii., after *Oncidium pubes* Lindl., under "Tetrapetala Macropetala." "*Obs.* Huc: *O. flabelliferum* Pinel in Paxton, Mag. Bot. xvi. ad p. 65. Descriptio, quæ addita, inanis, nec ad iconem bene confici potest. Equidem plantam

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* Walpers Ann. Bot. Syst. iii. 555; Lindley Folia Orch. pag. 58.

pro *Oncidio curto* Lindl. habuerim." Hence I suspected its being *O. curtum* Lindl., a rare species, near *Oncidium Gardneri* Lindl., but inferior in beauty. It is, indeed, not my fault that the late Dr. Lindley (Oncidium, Folia p. 58) said, "*Oncidium flabelliferum* Pinel in Paxt. Mag. Bot. xvi. p. 65, is referred to *pubes* by Rchb. f. (Walp. Ann. iii. 555)."

Thanking M. Barbusa Rodriguez for his courteous kindness in defending me in my suspected mistake, I must confess I did not want it. What makes the note more surprising is, that M. Barbusa Rodriguez immediately continues in stating that I have combined by mistake *Oncidium flabelliferum* Pinel and *Gardneri* Lindl. He teaches us this is not right, and endeavours to give comparative marks of distinction. Hence it results that the Professor makes one fine mixture of *Oncidium pubes*, *Gardneri*, and *flabelliferum*. It is impossible to follow well the ideas of M. Barbusa Rodriguez from his descriptions, yet he is quite right at all events in discerning his *Oncidium Gardneri* and *flabelliferum*. I have only to make the observation that, whatever his *Oncidium* "*Gardneri*" may be, it is decidedly not Lindley's. We must understand this from the remark, "mézochile long" [why not "mésochile long"?]. The isthmus (called mézochile by M. Barbusa Rodriguez) is as short as possible in Dr. Lindley's plant.

I am afraid M. Barbusa Rodriguez never saw Walpers 'Annales' in his life, else he would have found *Oncidium flabelliferum* both in vols. iii. and v., and have felt satisfied that Professor Reichenbach, after having spent nearly all the spare time of his life in orchidic studies, is really able to discern two such species as *O. pubes* Lindl. and *Gardneri* Lindl. (*flabelliferum* Pinel), without looking out for an excuse.

I have hundreds of such remarks to make, but there is indeed no great happiness to waste one's time with such polemics, which, however, must finally be written, and shall be written, also against Mr. G. Bentham.

A STUDY OF THE SURVIVAL OF THE FITTEST.

By J. G. Baker, F.R.S.

About three years ago a piece of ground at Kew was specially set apart to contain a collection of hardy herbaceous plants for the use of botanical teachers and their pupils. It was a perfectly level square of ground in the immediate neighbourhood of the Herbarium, which for a long time had been covered with grass, amongst which a few trees were planted. It was spaced out into beds with walks between them, and about 250 species were selected, and a good tuft of each was planted in the beds. Each species had a distinct plot allotted to it, the soil being quite uniform, and the species arranged according to their systematic sequence. I have now had the collection under constant inspection for three years, and have made a catalogue of the species, classifying them in three groups,

according to their power of survival under the conditions as explained, *viz.*, first, the species that show a decided tendency to spread themselves spontaneously over the walks and the plots of ground that properly belong to their neighbours; secondly, those which grow so as to fill up their property plots fairly, but do not spread; and, thirdly, those that, unless they were renewed, would soon die out and disappear. The foreman, Mr. Dewar, who has had charge of the collection since it was started, has looked over my lists and suggested a few alterations. I need not of course point out that the struggle for existence under the conditions as just explained is something quite different from, and very much less intense than, it would have been if the same species had been experimentised upon when grown mixed up together indiscriminately. It is very likely that many of the species placed in the category of those that have held their ground have not been reproduced from seed at all, but have simply multiplied from the original stock by mere vegetable reproduction. But of course to keep a record of a struggle for life in which a great many species were concerned, carried on under perfectly natural circumstances, would be a very difficult matter.

CLASS A. *Species that have shewn a distinct tendency to spread over the walks and take possession of the plots of ground that belong to their neighbours.*

Annuals and Biennials.—Ranunculus arvensis, R. lanatocarpus, Papaver Rhœas, P. somniferum, Eschscholtzia californica, Glaucium luteum, Chelidonium majus, Fumaria officinalis, Lepidium sativum, Capsella Bursa-pastoris, Koniga maritima, Iberis amara, Reseda lutea, R. Luteola, R. fruticulosa, Viola tricolor, Spergula arvensis, Silene Armeria, Lychnis Githago, Claytonia perfoliata, C. alsinoides, Geranium rotundifolium, Tropæolum majus, Malva rotundifolia, M. crispa, Impatiens parviflora, I. glanduligera, Œnothera biennis, Anthriscus Cerefolium, Digitalis purpurea, Collomia grandiflora, Atriplex hortensis, Euphorbia exigua, Bromus maximus, B. madritensis, Festuca pseudo-myurus. *Perennials.*—Aquilegia vulgaris, Lychnis Coronaria, Hypericum perforatum, Tellima grandiflora, Epilobium angustifolium, E. hirsutum, E. parviflorum, E. montanum, E. obscurum, Myrrhis odorata, Fœniculum vulgare, Pastinaca sativa, Ligusticum alatum, Dipsacus Fullonum, Artemisia vulgaris, Chrysanthemum Leucanthemum, Taraxacum officinale, Linaria vulgaris, Cynoglossum officinale, Convolvulus arvensis, Lysimachia vulgaris, Plantago major, P. lanceolata.—59 species.

CLASS B. *Species that have held their ground but do not spread.*

Clematis recta, C. tubulosa, Thalictrum Jacquinianum, T. glaucum, Ranunculus acris, Delphinium elatum, Aconitum Napellus, Pæonia officinalis, Papaver pilosum, Dicentra spectabilis, Arabis alpina, Cheiranthus Cheiri, Cardamine asarifolia, Brassica oleracea, Sisymbrium austriacum, Erysimum virgatum, Cochlearia officinalis, Iberis Garrexiana, Aubrietia deltoidea, Alyssum saxatile, Helianthemum vulgare, Dianthus barbatus, D. plumarius, Lychnis chal-

cedonica, Cerastium arvense, C. tomentosum, Gypsophila perfoliata, Hypericum calycinum, H. Androsæmum, Linum usitatissimum, L. perenne, L. tenue, Lavatera cretica, Malva Alcea, Althæa rosea, A. officinalis, Geranium nodosum, G. pratense, G. sylvaticum, G. Londesii, G. dissectum, Onobrychis sativa, Trifolium pratense, T. hybridum, Lupinus polyphyllus, Vicia sativa, Geum urbanum, Acæna polyphylla, Potentilla recta, P. argyrophylla, Spiræa Ulmaria, S. digitata, S. Filipendula, Agrimonia Eupatoria, Sanguisorba officinalis, Sedum Aizoon, S. spurium, S. maximum, Hoteia japonica, Heuchera glabra, Saxifraga umbrosa, S. ligulata, Œnothera glauca, Lythrum Salicaria, Bryonia dioica, Anthriscus sylvestris, Astrantia major, Peucedanum Petleri, Heracleum giganteum, Rubia tinctoria, Asperula odorata, Galium verum, Valeriana Phu, V. alliariæfolia, Campanula Trachelium, C. primulæfolia, Specularia Speculum, Phyteuma campanuloides, Scabiosa Columbaria, Silphium ternatum, Helianthus decapetalus, Achillea Ptarmica, A. tanacetifolia, Solidago canadensis, S. latifolia, Inula Helenium, Cirsium monspessulanum, Helenium autumnale, Heliopsis brevis, Tanacetum vulgare, Aster simplex, Rudbeckia laciniata, Cichorium Intybus, Eupatorium cannabinum, E. purpureum, Polemonium cæruleum, Symphytum asperrimum, S. tuberosum, S. ibericum, Myosotis arvensis, Omphalodes linifolia, Anchusa officinalis, Vinca major, V. minor, Atropa Belladonna, Solanum Dulcamara, Mimulus luteus, Scrophularia nodosa, Verbascum phlomoides, Antirrhinum majus, Veronica longifolia, Salvia Sclarea, Scutellaria galericulata, Origanum vulgare, Physostegia virginica, Marrubium vulgare, Monarda fistulosa, Lysimachia punctata, Rumex scutatus, R. Patientia, Polygonum Bistorta, P. affine, Rheum undulatum, Euphorbia palustris, Chenopodium Bonus-Henricus, Parietaria officinalis, Urtica dioica, Allium Porrum, A. fistulosum, A. Schœnoprasum, A. angulosum, Ruscus aculeatus, Asparagus officinalis, Polygonatum multiflorum, Funkia ovata, F. Sieboldiana, Juncus effusus, Luzula campestris, L. sylvatica, Carex remota, C. paniculata, C. vulpina, C. punctata, Lolium perenne.—144 species.

Class C. *Species that would soon become extinct unless renewed.*

Ranunculus bulbosus, Delphinium Ajacis, D. Consolida, Nigella sativa, N. damascena, Iberis umbellata, Argemone mexicana, Raphanus caudatus, Reseda odorata, Dianthus Caryophyllus, Lychnis Cœli-rosa, Malope trifida, Hibiscus Trionum, Lupinus luteus, L. nootkaensis, Lathyrus annuus, L. Ochrus, Phaseolus vulgaris, Cuphea silenoides, Loasa volcanica, Cucumis Melo, Coriandrum sativum, Carum Carvi, Vaillantia muralis, Valerianella vesicaria, Lobelia Erinus, Campanula Rapunculus, Tagetes patula, Hymenoxys californica, Phlox paniculata, P. Drummondii, Gilia tricolor, Eutoca grandiflora, Phacilia congesta, Convolvulus siculus, C. tricolor, Ipomæa purpurea, Hyoscyamus albus, Solanum guineense, Nicotiana Tabacum, N. longiflora, Collinsia bicolor, C. violacea, Blitum capitatum, Salsola Kali, Chenopodium Botrys,

Urtica pilulifera, Cannabis sativa, Amaranthus hypochondriacus, A. chlorostachys, Hordeum jubatum, H. distichon, Avena sativa, Phalaris canariensis, Polypogon monspeliensis, Lolium italicum.—56 species.

A NEW *PUCCINIA*.

By W. B. Grove, B.A.

For several years I have been acquainted with *Œcidium depauperans*, Vize, which has occurred near Birmingham, at Perry Barr, Moseley, and Sutton, on cultivated Violas; but until this year I have not seen the *Œcidium* followed by a *Puccinia*. This has now appeared at Sutton, and, as it seems to differ somewhat from *Puccinia violarum*, I have named it *P. ægra*. A description is annexed.

Puccinia ægra, n. sp.

I. *Œcidium depauperans*, Vize. — Cups on all green parts of the plant, scattered, *not collected on swollen patches*, roundish or elliptic, with a torn, white, sometimes recurved margin. Spores roundish or oblong, angular, smooth, orange-yellow, 17–21 μ long, 14–16 μ broad.

II. Pustules numerous, amphigenous, on yellow spots, not small, scattered or collected in groups, roundish, flatly convex, *covered with the silvery shining persistent epidermis.* Spores elliptic or obovate, delicately spiny, brown, about 28–30 μ long.

III. Pustules as in II. Teleutospores elliptic, oblong or roundish, *very irregular*, rounded or tapering at base or apex, sometimes truncate, smooth, not constricted, dark brown, 22–30 μ long, 18–24 μ broad.

This fungus attacks cultivated Violas of all colours, white, yellow, blue, and purple. The *Œcidium* appears at the end of May, and continues till autumn. The same plant which bears the *Puccinia* may still continue to produce the *Œcidium*, and *all three kinds of spores may be found even on the same leaf*. Its impoverishing effect is most marked; the stems affected by it become flaccid, lanky and yellow, with imperfectly developed leaves. The uredo-pustules, which are confined to the leaves and stipules, render them very weak and yellow; the epidermis remains for a long time as a dome-shaped covering, and at last splits irregularly or by a longitudinal fissure. The teleutospores are more usually broadest at the septum: they appeared in August.

ON THE FLORA OF INNISHOWEN, CO. DONEGAL.

By H. C. Hart, B.A.

(Continued from p. 209).

[Note.—By an unfortunate accident a page of MS. was overlooked at the time the last part of this Flora was sent to press. The following should be inserted after *Pulicaria*, at p. 206.—Ed. Journ. Bot.]

Filago germanica L. — Innishowen Head, Dickie ; about Greencastle, W. E. H.

F. minima Pers.—Sandy warren at Greencastle, W. E. H.

Gnaphalium uliginosum L. Common, and increasing northwards.

G. sylvaticum L.—Cultivated ground and pasture-lands, at about 300 to 500 feet above the sea, near Carndonagh, Moville, &c.; fields on the south side of the Scalp.

Antennaria dioica Gærtn.—On Doagh Island; plentiful on Crockaughrim and Bulbein Mount, and generally frequent.

(N.B.—It is remarkable to find *all* the Irish cudweeds represented in so limited a space.)

Senecio vulgaris L. *S. sylvaticus* L. *S. Jacobæa* L. *S. aquaticus* Huds.

Saussurea alpina DC.—Bulbein Mount, near the summit. See Journ. Bot. 1880, p. 330, where I first recorded this rare alpine plant for Donegal : it had been previously only known from Kerry in Ireland, although a manuscript note of its occurrence in Innishowen, by Robert Brown, was in existence. Since then I have discovered it in Mayo, Galway and Tipperary.

Arctium Lappa L. (*A. intermedium* Lange).—Local, W. E. H. ; Innishowen Head, Culdaff and Innishtrahull, Dickie ; about Ardmalin North.

Centaurea nigra L.—Common.

†*C. Cyanus* L.—Not infrequent ; amongst flax on reclaimed lands near Inch, &c.

Carduus crispus L.—At Knockglass, Malin, Dickie ; roadsides near Culdaff, 'Cyb. Hib.' I did not meet with this species.

C. tenuiflorus Curt.—Between Greencastle and Stroove, W. E. H. ; near Greencastle. This plant becomes very scarce in the north-west.

C. lanceolatus L. *C. arvensis* Curt. *C. palustris* L.

C. pratensis Huds.— Not infrequent, at 800 feet in a bog west of Slieve Main.

Lapsana communis L.—Common. This plant appears to have increased since 1864, the date of the 'Flora of Ulster.'

Hypochæris radicata L.—Abundant.

Apargia autumnalis Willd.—Abundant. Var. *Taraxaci* Smith. Innishtrahull, Dickie ; and elsewhere.

Stachys sylvatica L.

S. palustris L.—Abundant. Var. *ambigua* occurs at Muff, 'Cyb. Hib.'

S. arvensis L.—Leenane ; Glengad Head ; Ardmalin ; sandy ground at Ardmalin South, on the west side of Malin Head.

Teucrium Scorodonia L.—Abundant. A stunted variety, with thick, oblong, much wrinkled and closely reflexed leaves, occurs on the coast at Malin Head.

Ajuga reptans, L.

Pinguicula vulgaris, L.—Frequent.

P. lusitanica, L.—Common. At 1000 feet on the western side of Slieve Main.

Utricularia vulgaris L.—Race-course Bog, near Derry, and bogs at Culdaff, 'Fl. Ulst.'; Craig bog, between Muff and Derry, W. E. H.; bog-holes on the east side of the railway near Bridge-end, whence, like other species, it has spread down into the heavy dykes on the reclaimed land below Burnfoot.

U. minor L.—Bog-holes east of Lough Fad in the Mintiaghs; between Stoolary and Lough Inn, East Innishowen; between Lough Inn and Lough Fad in plenty; bog-holes near Bridgetown on the east side of the railway, with the last; Race-course Bog, near Derry, Dr. Moore, Ord. Surv. Rept.

Primula vulgaris Huds. *Lysimachia nemorum* L.

Anagallis arvensis L. *A. tenella* L.

Glaux maritima L. *Samolus Valerandi* L.

Armeria maritima Willd. *Plantago Coronopus* L.

P. lanceolata L.—A very stunted, linear-leaved form occurs at Malin Head.

P. maritima L.—Occurs inland sometimes in dry grassy places at low levels, and on the mountains.

P. major L.—Frequent.

Littorella lacustris L.—Abundant in the mountain lakes, excepting the two quite barren ones upon Erris.

Beta maritima L.—Dickie describes this as being "very rare on muddy seashores," in which he is right, but it is abundant on maritime cliffs in many parts of Donegal. In Innishowen, I met with it first about $\frac{3}{4}$ of a mile west of the signal tower on Malin Head; afterwards it becomes frequent round to Lough Swilly, wherever rocky headlands occur, and rarely on dry sand or shingly shores.

Chenopodium album L.

C. Bonus-Henricus L.—Culdaff, Dickie. Plentiful by the roadside south of Culdaff and in the village.

Suæda maritima Forst.—Muddy shore near Fahan. Rare in Donegal.

Salsola Kali L.—At Culdaff and Malin, Dickie; at Ardmalin South, on the west side of Malin Head; Malin Estuary.

Salicornia herbacea L.—Estuary at Culdaff. Scarce in Donegal.

[*Atriplex laciniata* Sm.—"Sandy sea-shore, frequent," 'Flor. Ulst.' This is certainly an error; probably *A. Babingtonii* (Woods) was the species meant.]

A. angustifolia Sm.—Stroove; about Ardmalin South, on the west side of Malin Head.

A. Babingtonii Woods.—Common.

A. hastata L.—Common. Var. *deltoidea* occurs at Glennagiveny Bay.

Rumex conglomeratus Murr. *R. sanguineus* L.

R. obtusifolius L.—An unusually luxuriant growth of this species by the railway between Fahan and Inch Road was, I regret to say, erroneously recorded as *Rumex Hydrolapathum* Huds. The latter cannot therefore be included in the Flora of Donegal.

R. crispus L.

[*R. Hydrolapathum* Huds.—Recorded by mistake. See under *R. obtusifolius*.]

R. Acetosa L. *R. Acetosella* L.—Common. Both occur on the summit of Slieve Snacht, 2019 feet.

Polygonum viviparum L.—Very rare. Sparingly on Bulbein Mount in two places, where I discovered it in 1879. Elsewhere it occurs in Ireland only on the Benbulben and Glenade Mountains, in Sligo and Leitrim.*

P. amphibium L.—Common.

P. lapathifolium L.— At Malin, Dickie; not infrequent in the northern parts of the district.

P. Persicaria L. *P. Hydropiper* L. *P. aviculare* L. *P. Convolvulus* L.—All common. I cannot agree with Dickie's remark that *P. Hydropiper* is "rather local." In the northern parts of Donegal it is a very common species. *P. littorale* (Link), a variety of *P. aviculare*, occurs on Inch Island and by the shore at Ardmalin South.

P. minus Huds.—Near Malin Well, Dickie.

P. Raii Bab.—Malin, Dickie; sandy ground between Dunargus and Malin Estuary.

Empetrum nigrum L.—Frequent, and nearly at sea-level in many places. Summit of Slieve Snacht, 2019 feet.

‡*Euphorbia Helioscopia* L.—Common, but probably a colonist.

E. portlandica L.—Base of the cliffs westward of Knockglass, Malin, Dickie; rocks at Cockmanny, and at the base of Binnion Mountain, 'Cyb. Hib.'

†*E. Peplus* L.—Common. More abundant than *E. Helioscopia* in some districts, and looking native, but I regard these two as colonists in Donegal. *E. Helioscopia* has a wider range northward and westward.

‡*E. exigua* L.—Fields on Inch Island near the Castle. Very rare in Donegal.

Ceratophyllum demersum L.—In a marsh by the side of the Foyle above Derry, Dr. Moore, Ord. Surv. Rept.

C. verna L.—Common. *C. platycarpa* Kutz., is also common.

C. hamulata Kutz.—Common in the mountain-lakes.

Parietaria diffusa Koch.—Walls of Derry.

Urtica urens L. and *U. dioica* L.—Common.

Salix pentandra L.—In a glen above Moville.

‡‡*S. viminalis* L.—Frequent, but not native.

†*S. alba* L.—About Ballyliffin, apparently wild.

S. cinerea L. and *S. caprea* L.—Common.

S. aurita L.—Frequent.

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* Since writing the above the author has discovered this species on Brandon, in Kerry.

S. repens L.—Innishowen Head and northward, abundant.

S. herbacea L.—Bulbein Mount, from 1200 to 1620 feet; Slieve Main, at 1500 feet; Erris Mts., at 1100 feet; on Coolcross, on rocky ledges looking north-east, at 870 and at 900 feet. This alpine willow has been recorded from Clontygearagh Mountain, in Derry, at 1000 feet, which was then considered the lowest elevation in the British Islands. In Scotland its lowest recorded elevation is at 1600 feet in Orkney.

Populus tremula L.—Sea-cliffs at Giveney and Malin, Dickie; Innishowen Head.

Myrica Gale L.—Frequent in the mountainous districts; at 850 feet, west of Slieve Main.

Betula alba L.—Frequent, and occurring along the coast, as at Innishowen Head, as well as in glens, &c., inland.

(To be continued.)

DISPOROPSIS, GENUS NOVUM LILIACEARUM,

AUCTORE H. F. HANCE, PH.D.

PERIGONIUM corollinum, campanulatum, basi leviter saccatum, segmentis 6, subæqualibus, crassiusculis, uninerviis, tubo duplo longioribus. Corona apice tubo inserta, lobis paulo brevior, ultra medium in lacinias 6, staminibus alternantes, lineares, acutas, conniventes, genitalia omnino velantes, fissa. Stamina 6, inter coronæ lobos affixa; filamentis brevissimis; antheris introrsis, brevibus, dorsifixis, secus margines dehiscentibus. Ovarium sessile, ovoideum, trigastrum, triloculare. Stylus brevis, crassiusculus; stigma punctiforme. Ovula in quoque loculo 4, angulo interno affixa, horizontalia. Bacca . . . . ? Herba rhizomatosa, caulescens, habitu *Disporo pullo* Salisb. non absimilis, foliis alternis, tenuiter membranaceis, longitudinaliter nervosis, floribus axillaribus, pedicellis apice articulatis.

Genus inter Convallarieas juxta *Polygonatum* collocandum, ab omnibus contribulibus corona sane distinctissimum.

D. fusco-picta. — Rhizomate crasso viridi, caule simplici basi vaginis 1–2 membranaceis albidis purpureo-maculatis 1–3 poll. longis cincto pedali et ultra inferne tereti nudo fusco-purpureo-marmorato superne læte viridi flexuoso, foliis 4–6 versus apicem approximatis lanceolatis distincte petiolatis secus caulem linea tenui elevata decurrentibus acutis glaberrimis lucidulis 5 poll. longis ad 2 poll. latis nervis validioribus 4 intermediis tenuissimis crebris venulis transversis inconspicuis, floribus solitariis, pedicellis floriferis cernuis 5 lin. longis, perigonii 8 lin. longi albidi segmentis intus punctis plus minus crebris purpureo-fuscis pictis, staminibus perigonio fere duplo brevioribus antheris bilinealibus.

In montibus Lo-fau-shan, prov. Cantonensis, m. Septembri 1882, coll. rev. E. Faber. (Herb. propr. n. 22186).

Character e planta viva erutus. Floret Maio.

SHORT NOTES.

Flora of Lancashire. — We are pleased to learn that an important gap in our local Floras is likely to be filled up before long. Mr. J. C. Melvill has undertaken to collect material for a Flora of Lancashire, and will be glad to receive lists or other information from those acquainted with the botany of any part of the county.

New Forms of Potamogeton.—The 'Scottish Naturalist' for July contains the following descriptions:—

"*Potamogeton pusillus* L., var. *Sturrockii* A. Bennett.—Stem much branched, 18 in. to 3 ft. long; leaves 1½ in. to 2 in. long, ⅛ in. broad, with the secondary veins indistinct. Stipules ½ in., blunt. Peduncles 1 in. to 2½ in. long; spike ¼ in., very sparingly flowered; sepals thick. A very elegant subspecies of *pusillus* L., with somewhat the habit of *obtusifolius* M. & K. Quite distinct from anything seen from Europe or N. America" (p. 28).

"*Potamogeton pusillus* L., var. *rigidus* A. Bennett.—Plant rigid, fragile, leaves rigid, 1 in. to 2½ in. long, acuminate, strongly 1-nerved, with two fainter nerves in some of the leaves; stipules long, acute; peduncles 1 in. long; spike ½ in. long; fruit slightly smaller than in typical *pusillus*, and less carinated on the back. A remarkable form of *pusillus*, gathered by Dr. Trail from the Loch of Stennis, Orkney, August, 1876. It has much the aspect of *P. rutilus* Wolfgang, but differs by its elongated internodes, broader leaves, stipules, and fruit" (p. 25).

Polypodium Dryopteris and P. Robertianum in Bucks.—Last June the Rev. A. Robertson and Mr. Armstrong were botanising in South Oxfordshire, and in a small spinney on the borders of the county gathered some specimens of the oak fern. As they were not certain as to the exact wood it was found in, being unprovided with an ordnance map, I went over to Princes Risborough and walked to Chinnor, and after some time found the fern in a small spinney, locally known as Bollard's Wood, which actually forms the border of the county, the wood being just in Buckinghamshire. The fern is plentiful, but restricted to a small space, and is associated with *L. spinulosa* and *L. dilatata*. It is apparently absent from the large neighbouring wood, Tunley Wood, *Pyrola minor* and *Hordeum sylvaticum* plentifully occurring. *P. Robertianum* is given for Bucks in 'Top. Bot.,' on the authority of a specimen seen by Mr. Britten; but the above is the only record of *Dryopteris* for Central and Southern England, the nearest stations being West Gloucester and Staffordshire.—G. C. Druce.

As a pendant to Mr. Druce's note, it may be worth while to give details as to the single instance known of the occurrence of *P. Robertianum* in Buckinghamshire. About 1863 Mr. H. Ullyett (now of Folkestone) found two specimens in King's Wood, close to Hazlemere, a village near High Wycombe. The most careful search on his part, and subsequently on mine, failed to discover another specimen; nor have I heard of its having been found there

before or since. In Oxfordshire, where it is recorded as having occurred at Wychwood Forest, I believe it has not been found for many years.—James Britten.

Naturalised Plants. — I remember that Prof. Thiselton Dyer as far back as 1871 called attention in this Journal to the plants observed on the site of the Exhibition of 1862, amongst which he mentioned *Epilobium angustifolium*. Since then I have frequently noticed that this plant has a remarkable tendency to hold its ground wherever it once obtains a footing. On the railway running from Whitchurch to Ellesmere, which crosses an extensive bog known as Whixall Moss, it lines both sides of the road, and when I passed there last week formed a very showy and conspicuous object. I noticed the same plant on Shawbury Heath, forming an extensive bed. When wandering up a retired valley of the Long-mynd recently, near Church Stretton, I was much surprised to find *Mimulus moschatus* in vigorous growth by the side of a little mountain-stream. Naturally curious to know how it came to be in such an out-of-the-way place, I followed the stream a short distance up, and found it passed a cottage whence no doubt it had escaped. Many of the cottiers hereabout are fond of their gardens, and possibly at some future time other instances of naturalisation may be observed in out-of-the-way spots.—W. Phillips.

Myosurus minimus, Native or Colonist? — This plant, extinct in South Cambridgeshire, still grows abundantly about Chatteris on sandy and gravelly highland loams, rarely extending to the black soil of the fens. It is usually found only in wheat-fields, as it is an early plant, and consequently destroyed by the spring tillage necessary for other crops. Thus it has the appearance of a colonist, but perhaps only because the natural conditions of its growth have been destroyed by cultivation. A more natural habitat is under trees growing on old highland pastures at Woods End, near Chatteris, where the soil is bared by the stamping of cattle which congregate for shade and to resist the attacks of flies. In such situations it successfully disputes the bared ground with *Poa annua*, and even extends for some little distance amongst the permanent herbage of the field. Our turbaries give evidence of the abundance of wild cattle in pre-historic times, so that we may fairly assume that *Myosurus* did not then lack the "cultivation" which seems necessary for its growth, and it may therefore be truly native. Has anyone seen it growing in "waste places"?—Alfred Fryer.

Tolypella prolifera Leonh. in Lincolnshire.—While botanizing in Deeping Fen, South Lincolnshire, at the end of July last, I observed the above plant in two places. It was rather frequent in one drain in the Fen, and I found a single specimen in another drain about four miles distant. Its occurrence in the various drains probably depends chiefly on the time of year at which they have been cleared of weeds. Rare even as a European plant, it is not known to have been gathered in England since the time of the

late Mr. Borrer, who first found it in Sussex in 1827, and I understand that it cannot now be found in the Irish station. I observed several other species which have not been recorded for South Lincolnshire, and upon these I hope to make a few remarks at a future time.—W. H. Beeby.

A New British Lichen. — Mr. James M'Andrew, of New Galloway, has recently found *Synalissa intricata* Arn. on the north side of Black Craig, New Galloway; this is new to Britain, and is a very interesting discovery. I may add that Mr. M'Andrew has recently added a large number of plants to the flora of the South-West of Scotland.—W. West.

OFFICIAL REPORT FOR 1882 *OF THE DEPARTMENT OF BOTANY IN THE BRITISH MUSEUM.*

By W. Carruthers, F.R.S.

The preparation of the cases in the public Gallery has occupied much of the time of the officers of the Department during the year. Specimens fitted to exhibit the characters of the various Natural Orders of Flowering Plants have been selected, mounted, and arranged in the cases.

There have been incorporated with the great Herbarium series of plants belonging chiefly to the following Natural Orders:—*Capparideæ*, *Cruciferæ*, *Caryophylleæ*, *Turneraceæ*, *Onagraceæ*, *Lythraceæ*, *Cucurbitaceæ*, *Compositæ*, *Acanthaceæ*, *Campanulaceæ*, *Orchidaceæ*, *Liliaceæ*, *Amaryllidaceæ*, *Juncaceæ*, *Eriocauloneæ*, *Cyperaceæ*, *Filices*, and *Fungi*.

A portion of the extensive herbarium of Mosses recently purchased from the representatives of Dr. Hampe has been mounted and arranged for consultation.

The collection of plants in spirits has been classified and arranged in the new cabinets prepared for its reception.

Large additions have been made to the British Herbarium.

The principal additions to the collections during the year have consisted in a continuation of the valuable Herbarium of Indian Plants presented by Charles Baron Clarke, Esq., F.R.S., amounting to 2335 species; of 187 species of Himalayan Plants collected and presented by J. F. Duthie, Esq., of Saharunpore; a small collection of Australian plants, presented by J. C. Melvill, Esq.; and an extensive collection of plants from Japan, from the Herbarium of J. Bissett, Esq. By purchase the following collections have been acquired:—201 plants from Central Victoria, Australia; 1962 plants from Mexico, collected by Parry and Vasey; 320 plants from the southern United States, collected by A. H. Curtis; 300 plants from Washington Territory, collected by Suksdorf; 475 from Arizona, collected by Lemmon; 100 plants from Sicily; 100 plants from Lapland; 340 species of German Fungi from Thuemen;

200 species of Fungi from Italy, collected by Saccardo; 50 species of Fungi from Austria, collected by Rehm; and 400 species of American Fungi from Ravenal; 200 species of Lichens from Finland, collected by Norrlin; and 135 species of Lichens from Burmah, collected by the late Dr. Maingay; 200 Algæ from Mauritius, collected by Robillard; the collection of Diatomaceæ formed by the late Rev. E. O'Meara, containing 1155 specimens; and 500 European Cryptogamia, collected by Sintenis.

A series of fruits, and of complete plants of Myrmecodia from Java, collected by H. O. Forbes, have been added to the collections of fruits and woods.

To the British Herbarium there have been added 461 species from the Rev. W. H. Painter; 392 species from C. Bailey, Esq.; 80 species of Sussex plants from F. C. S. Roper, Esq.; 76 species from G. C. Druce, Esq.; 51 species from Messrs. H. & J. Groves; and specimens of rare and critical species from W. E. Beckwith, Esq., T. R. A. Briggs, Esq., F. Arnold Lees, Esq., W. P. Hiern, Esq., B. King, Esq., Dr. F. Buchanan White, R. M. Christy, Esq., H. G. Glasspoole, Esq., G. Nicholson, Esq., Miss Staveley, J. Whyte, Esq., Mrs. Pierce Butler, Miss Kinahan, J. W. White, Esq., J. F. Ward, Esq., H. D. Geldart, Esq., the Rev. R. P. Murray, J. Saunders, Esq., and D. Dewar, Esq.

Specimens of Cryptogams for the British Herbarium have been presented by the Rev. H. P. Reader, W. H. Pearson, Esq., Mrs. Alfred Tyler, Mrs. Briscoe, J. Saunders, Esq., R. Canterbury, Esq., and W. G. Smith, Esq., and a series of 87 Lichens from R. V. Tellam, Esq.

Valuable additions have been made to the collection of prints and drawings of plants by the presentation by the Misses Maund of the original water-colour drawings of the plates in Maund's 'Botanic Garden,' representing 1248 plants, and by the purchase of an extensive series of original drawings of Indian Plants contained in 13 folio volumes, formerly the property of Dr. Fleming.

NOTICES OF BOOKS.

Topographical Botany: being local and personal records towards showing the Distribution of British Plants, traced through the 112 *Counties and Vice-counties of England, Wales, and Scotland.* By Hewett Cottrell Watson. Second Edition [by J. G. Baker and W. W. Newbould], corrected and enlarged. London: Quaritch. 1883. 8vo, pp. xlvii., 612, with map.

It would be difficult to find a work which has been looked forward to with more anxiety than this new edition of 'Topographical Botany'; difficult, too, to find a book which more thoroughly fulfils the anticipations formed of it. That these anticipations were high it is unnecessary to assert. In the whole range of British

botanists it would have been impossible to find two so well fitted for the task of editing the work as those whose names are attached to the short preface with which it opens. United to Mr. Watson by strong ties of personal friendship, Mr. Baker and the Rev. W. W. Newbould are otherwise singularly well adapted to carry on his work, possessing, as they do respectively, the faculty of generalisation and the critical mind which were combined in Mr. Watson with such happy results.

Only a hundred copies of the original edition of 'Topographical Botany' were printed, and those were privately distributed, so that to very many the present will be a new book. To the possessors of the first edition the present one will also be indispensable, the additions, made for the most part by Mr. Watson himself in an interleaved copy, being very considerable:—"The few additions which we have made on our own authority," say the editors, "may be distinguished by having the name of the personal authority placed in parentheses." It seems to be implied, therefore, that every other addition and alteration is Mr. Watson's own. Some of these alterations are a little puzzling. For example, in ed. 1, *Adonis autumnalis* is recorded as "non-indigenous"—that being the meaning attached by Mr. Watson to curved brackets—from counties "5 6 7 13 14 17 18 19 21 to 29 33 34 40 55 57 58 59 62 64 66 68 75 77 83": in the new edition it is recorded as a "supposed error"—for this is the signification of the square brackets—from "25 26 27 28 29 33 34 40 55 57 58 59 62 63 66 68 75 77 80 83." Apart from the alteration in the estimate of the position of the species, we cannot help wondering what has become of the previously-given records for the counties between 5 and 24. Have they slipped out unnoticed? *

But puzzles of this kind are scarce; not so the evidences of care and steady work, which may be traced on every page. The segregates have received much attention,—*Ranunculus aquatilis*, for instance, represented by only 3 in the 1st edition, has here 10 placed under it. We are surprised, by the way, to find *R. penicillatus* (*pseudofluitans*) credited to only 6 counties, and suspect that some of those placed under *fluitans* should be transferred here. Prof. Babington contributes the distribution of the fruticose *Rubi*; the Roses remain much as before. Detailed distribution of the Callitriches is given, 6 species being enumerated. The *Hieracia* have received much attention, no fewer than 20 segregates being added. *Galinsoga parviflora* is inserted as naturalised in Surrey and Middlesex.

A comparison between the two editions is full of interest, and suggests many points for enquiry, the reasons for certain changes not being always apparent on the surface. But space will not permit us to enter at further length upon the investigation of the work; nor indeed is it necessary to do so. To all who are interested in County Floras, or in the general subject of plant distribution in Britain, 'Topographical Botany' is indispensable.

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* We have since learned from Mr. Baker that this is the case.

Itinera Principum S. Coburgi. Die Botanische Ausbeute von den Reisen ihrer Hoheiten der Prinzen von Sachsen-Coburg-Gotha. I. Reise der Prinzen Philipp und August um die Welt (1872–1873). II. Reise der Prinzen August und Ferdinand nach Brasilien (1879). Beschrieben von Dr. Heinrich Ritter Wawra v. Fernsee, K. K. Marine-Stabsarzt d. R. Erster Theil. Wien: Carl Gerold's Sohn. 4to, pp. xviii. 182, tt. 39.

A sumptuous book, in the best style of topography and chromo-lithography, containing an enumeration of the Monocotyledones and Dicotyledones collected on two voyages of the Princes of Saxe-Coburg Gotha,—one round the world, and the second to Brazil only,—together with descriptions and coloured figures of a number of new species. The value of this book lies in the admirable illustrations. Anyone familiar with the "*Aroideæ Maximilianæ*" can form an idea of their quality, as the drawings are by the same artist,—Leipoldt,—and the chromo-lithography by the same printer.

The voyage around the world was accomplished by various modes of travelling, and the stoppages were mostly of short duration. Liverpool was the point of embarkation, and New York their destination, where they arrived August 10th, 1872. A few days were spent in making excursions from the latter city, and then the party proceeded by Pacific Railway to California, visiting Salt Lake City on their way, where the first collecting was done. On September 27th they left San Francisco for the Sandwich Islands, or, as we ought to say now, Hawaia. Here an accident prevented Dr. Wawra from collecting, but their stay was only of a week's duration; and their next landing place, except for a few minutes in the Samoa Islands, was Auckland, in New Zealand, arriving there in the middle of October. Sydney was reached by the 24th of the same month, and left again on the 26th. A little more than a week was spent in Victoria, and a few hours in the neighbourhood of Albany, W. Australia; and by the end of November the travellers were in Ceylon. Then followed a flying visit to Japan, touching at Singapore, Saigon, Hong-Kong, and Shanghai; and calling at Batavia on the return voyage. Ten days were spent in Java; and the next place visited was Pulo Penang, where, however, the stay was of the briefest, as they embarked for Bombay the same evening, and arrived there on March 12th. Thence a tiger-hunting and sight-seeing tour was made through India. This lasted about three weeks, and the greater part of the time was spent in rapidly travelling from place to place. The homeward voyage was by way of the Suez Canal; and the party arrived in Vienna on April 20th, 1873.

From the foregoing brief sketch of the route, it will be evident that the botanical collections could not be very extensive; yet we find new species described from Australia, Java, and India. But the greater part of the botanical collections was made during

a month's stay in Brazil, in 1879, special attention having apparently been paid to the *Bromeliaceæ*, more than half of the plates being devoted to that natural order.

The greater part of the novelties discovered, and here figured for the first time, have been already published by Dr. Wawra in the 'Œsterr. Botanische Zeitschrift'; so that we have in the present volume only seven species hitherto undescribed:—*Psidium Itatiaiæ*, *P. paraibicum*, *Oxymeris Itatiaiæ*, *Symplocos Itatiaiæ*, *Ebermaiera gracilis*, *E. Itatiaiæ*, *Argostemma javanicum*,—all, save the last, being from Brazil.

We are glad to welcome the first number of vol. xii. of the 3rd edition of 'English Botany' (Bell & Sons, York St., W.C.), in which the Vascular Cryptogams are begun. It contains twenty plates, three of which—*Isoetes lacustris* var. *Morei*, *I. Hystrix*, and *I. echinospora*—are entirely new: it is, we think, to be regretted that some of the old plates—notably the very inadequate one of *Osmunda regalis*—should not also have been superseded. The descriptions of the species are well up to the standard of the former volumes. *Lycopodium complanatum*, somewhat to our surprise, is only given as an excluded species, and, what is still more remarkable, no allusion whatever is made to the Gloucestershire plant which Prof. Babington and Mr. Carruthers agree in referring to that species.* It is scarcely correct to say that Dr. D. Moore described his *Isoetes Morei* as "a distinct *sub*-species": he called it a new *species* of *Isoetes*." We are glad to note the absence of the so-called "popular portion" of former volumes. It is to be hoped that the work will quickly proceed to completion.

In the 10th part of the 'Flora of British India,' Sir J. D. Hooker describes the *Asclepiadeæ* and *Scrophularineæ*, the remaining orders —*Loganiaceæ*, *Gentianaceæ*, *Polemoniaceæ*, *Hydrophyllaceæ*, *Borragineæ*, *Convolvulaceæ*, *Solanaceæ*—being the work of Mr. C. B. Clarke. In the first-named, several new genera are established—*Atherolepis*, *Genianthus*, *Pentabothra*, *Adelostemma*, *Lygisma*, *Treutlera*, and *Dittoceras*. The inaccurate method of citation which has characterised the work almost throughout still continues; thus, the five species of *Trigonitis* are ascribed to "Benth. in Gen. Pl. ii. 558," but not one of them is there specifically named.

We regret to see that Messrs. George Bell & Sons have printed the misleading words "eighth edition" and the date 1883 on the cover of a recent issue of the 'London Catalogue.' It is merely the seventh edition in a new wrapper, not the smallest alteration being made in the text: this is obvious from the reference, at p. 31, to "this seventh edition," while the work ends with the announcement that "inquiries may be addressed to the compiler, Hewett C. Watson"! The mistake has since, we understand, been rectified as far as possible, but copies are in circulation lettered "eighth edition."

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* Journ. Bot. 1882, 391, t. 233.

We ought ere this to have noticed Mr. W. Jolly's 'Life of John Duncan, Scotch Weaver and Botanist' (1794–1881), (Kegan Paul & Co.). It is a biography of the style with which Mr. Smiles has made us familiar, and of a man of the type of Robert Dick and Thomas Edward; and we do not intend to disparage its merit when we say that both in subject and treatment it seems to us to fall short of the two lives just named. But Mr. Jolly has made too big a book out of the materials at his disposal; and his merits as a biographer fall short of those of Mr. Smiles. It is somewhat a matter of wonder to us that no work in similar style has been undertaken for any of our English working-men naturalists: there have been men in Lancashire who have quite as much claim on public notice as either John Duncan or Mr. Smiles's Scotch *protégés*. In the Appendix is given a "List of Plants found in the Vale of Alford and the surrounding districts of Aberdeenshire," and some notes on other plants found in Duncan's herbarium. A capital etched portrait of Duncan in his seventy-second year serves as frontispiece to the volume.

Dr. Masters has contributed a handy little volume on 'Plant Life' to the series of the Handbooks of the Farm now being issued by Messrs. Bradbury, Agnew & Co. His aim is "to supply a sketch of the physiology or life-history of plants; of the way in which they are affected by the circumstances under which they exist, and of the manner in which they in their turn react upon other living beings and upon natural forces"; and in this he seems to have succeeded. We regret that the pressure on our space prevents our giving a more detailed notice.

Messrs. W. Swan Sonnenschein & Co. have just added to their marvellously cheap series of 'Young Collectors' Handbooks' one on 'Flowering Plants' by Mr. Britten. It would obviously be unfitting to say more in this Journal; but the fact that a handbook devoted to the collection and preservation of plants, consisting of thirty-two well-printed pages, fully illustrated, can be obtained for the sum of one penny is sufficiently remarkable to claim this word of notice. The same publishers send us 'A Season among the Wild Flowers,' by the Rev. H. Wood—one of those popular introductions to a knowledge of British plants of which the number seems almost unlimited.

Articles in Journals.—August.

American Journal of Science. — J. S. Newberry, 'Fossil Plants from North China.' — A. Gray & J. H. Trumbull, 'Review of De Candolle's Origin of Cultivated Plants' (contd.).

American Naturalist. — E. J. Hill, 'Means of plant-dispersion.' — M. E. Jones, 'New Plants from California and Nevada, &c.' (*Thelypodium neglectum*, *Sisymbrium acuticarpum*, *Sidalcea calycosa*, spp. nn.).

Ann. Sciences Nat. (Bot., 6th S., t. xv., Nos. 5, 6: June).— A. Franchet, 'Plantes du Turkestan' (contd.: *Astragalus neurophyllus*, *A. inturrensis*, *A. variegatus*, *Oxytropis tachtensis*, *O. Capusii*,

Hedysarum Cephalotes, *Onobrychis elegans*, spp. nn.). — M. Cornu, 'Sur quelques Ustilaginées nouvelles ou peu commes' (*Testicularia Leesiæ*, *Doassansia Farlowii*, *Melanotænium* (*?*) *scirpicolum*, spp. nn.: 3 plates).—A. Lemaire, 'De la lignification de quelques membranes épidermiques.' — P. Sagot, 'Plantes de la Guayane Française' (contd.: *Hirtella prœalta*, *Licania robusta*, *L. majuscula*, *Moquilea minutiflora*, *M. licaniæflora*, *Clidemia micrantha*, *C. Drosera*, *Tschudya robusta*, *Henriettea maroniensis*, *H. Sagotiana* (Naud. ms.), *Mouriria Sideroxylon*, *M. crassifolia*, spp. nn.). — A. J. Nathorst, 'Flore fossile du Japon.'—G. Bainier, 'Sur les Zygospores des Mucorinées' (3 plates).—T. W. Engelmann, 'Couleur et Assimilation.'

Botanical Gazette.— L. H. Bailey, Biographical Notice of John Leonard Riddell (1807–1865). — W. G. Farlow, '*Ustilagineæ* of United States' (*Entyloma Compositarum* Farl., *E. Besseyi* Farl., *E, Lobeliæ* Farl., *E. Memispermi* Farl. & Trelease, *Doassansia Epilobii* Farl., spp. nn.).—M. Krapp, 'Thistledown.'—A. Gray, '*Rhododendron Vaseyi*.'—R. M. Austin, '*Sarcodes sanguinea*.'

Botanische Zeitung (July 20). — J. Wortmann, 'Ueber ein Einfluss der strahlenden Wärme auf wachsende Pflanzentheile' (concluded).—P. Ascherson, '*Oudneya africana*.—(July 27–Aug. 10). A. Meyer, 'Ueber Krystalloide der Trophoplasten und über die Chromoplasten der Angiospermen.'—(Aug. 10, 17, 24). J. Boehm, 'Ueber das Verhalten von vegetabilischen Geweben und von Stärke und Kohle zu Gasen.'

Botanisches Centralblatt (No. 30). — C. Müller, 'Meine Stellung zur Frage von den Spermamöben der Saprolegnieen.' — (No. 33). A. Zalewski, 'Zur Kenntniss der Gattung *Cystopus*.' — (No. 34). F. Pax, '*Epilobium Uechtritzianum*' (*trigonum* × *virgatum*).

Bull. Soc. Bot. France (xxx., pt. 3).—M. Cornu, 'Contributions à l'étude des Ustilaginées.'—E. Prillieux, 'Germination des oospores du *Peronospora viticola*.' — E. Roze, 'Parasitisme du *Morchella esculenta* sur l'*Helianthus tuberosus*.' — E. Heckel, 'Sur l'intensité du coloris et les dimensions considérables des fleurs aux hautes altitudes.'—C. E. Bertrand, 'De type Tmésiptéridée.'—G. Bonnier & L. Mangin, 'Sur la vie des Champignons dans l'air confiné.'—P. Van Tieghem, 'Sur quelques points de l'anatomie des Cryptogames Vasculaires.' — E. Fournier, 'Plantæ Mexicanæ a cl. E. Kerkero collectæ' (*Sclerocarpus Kerberi*, *Loranthus Kerberi*, *Elephantopus cuneifolius*, *Quamoclit Kerberi*, spp. nn.). — E. Cocardas 'Récherches Cryptogamiques sur les altérations des eaux distillées.'

Bulletin of Torrey Botanical Club (July). — C. H. Peck, 'New Fungi' (plate of *Boletus Morgani*, n. sp.). — J. B. Ellis & B. M. Everhardt, 'New Fungi.' — F. L. Scribner, 'Grasses from Washington Territory' (*Glyceria Canbyi*, n. sp.).—R. E. Kunze, 'Fertilization of *Opuntia*.'

Garden (Aug. 4). — *Lilium avenaceum* (fig.); *Pavonia Wiotii* (ic. pict.).—(Aug. 11). *Laelia harpophylla* (ic. pict.).—P. G. Adams, 'Trip to the Southern Alps, New Zealand.' — (Aug. 25). *Begonia Roezli* (ic. pict.).

Gardeners' Chronicle (Aug. 4). — *Phacelia campanularia* (fig. 22). —*Acrostichum magnum* Baker, sp. n.—*Rodgersia polyphylla* (fig. 23). — List of Garden Orchids (*Epidendrum*, contd.). — J. G. Baker, 'Species of *Tulipa*' (contd.). — *Scilla livida* Baker, *Trichopilia Kienastiana* Rchb. f., *Calanthe anchorifera* Rchb. f., spp. nn. — G. Nicholson, 'The Banded Rush' (*Juncus zebrinus* Hort.= *Scirpus Tabernæmontani* var. *zebrina*). — *Notospartum Carmichaeliæ* (fig. 26). —*Caccinia glauca* (fig. 27). — *Masdevallia Carderi* (fig. 30). — (Aug. 18). *Peristeria ephippium* Rchb. f., sp. n.—F. Gunning, 'Wild Plants of Bristol District.' — A. D. Webster, 'British Orchids and their cultivation.' *Armeria cephalotes* var. *bracteata* (fig, 34).—(Aug. 25). *Vanilla Pfaviana* Rchb. f., *Masdevallia calura* Rchb. f., *Duvalia angustiloba* N. E. Br., spp. nn. — *Doronicum plantagineum* var. *excelsum* N. E. Br.—M. Foster, 'Notes on Irises' (*I. Milesii*, sp. n.). —N. E. Brown, '*Oncidium candidum*' (=*Palumbina candida* Rchb. f.) (fig. 35).

Journal of Royal Microscopical Soc. (Transactions). — C. G. Matthews, 'On the Red Mould of Barley' (2 plates).

Midland Naturalist. — J. E. Bagnall, 'Flora of Warwickshire' (contd.).

Œsterr. Bot. Zeitschrift.—E. Formánek, 'Messungen an *Orchis latifolia*.'—F. A. Hazslinszky, '*Heterosphæria Patella*.'—F. Jordan, 'Blüthenabweichungen.' — S. von Schulzer, 'Mykologisches' (*Agaricus inarmillatus*, *A. permodestus*, spp. nn.).—B. Blocki, 'Flora von Galizien' (contd.).—P. G. Strobl, 'Flora des Etna' (contd.).

Pharmaceutical Journal (Aug. 4). — D. Howard, 'Notes on Cinchona Bark.' — T. Peckolt, 'Comparative List of Popular and Scientific Names of Economic Plants of Brazil.'

Science-Gossip.—J. Wager, 'The Danish Forest.'—J. Saunders, 'Daisy Sleep.'—C. F. W. T. Williams, 'Microfungi Bathonienses.' —W. Bailey, 'Motion in fruit of *Tilia europæa*.'

Scottish Naturalist (July).—W. J. Fortescue, 'Flowering Plants and Ferns of Orkney' (contd.: *Potamogeton pusillus* var. *rigidus* A. Bennett: see p. 279). — A. Sturrock, '*Potamogetonaceæ* of Perthshire' (*P. pusillus* subsp. *Sturrockii* A. Bennett: see p. 279). — J. Stevenson, 'Mycologia Scotica' contd.—J. Roy, 'Desmids of Mull.' — Obituary Notices of G. Dickie, R. Parnell, Sir C. Wyville Thomson, and J. Sadler.

Trans. Bot. Soc. Edinburgh (xiv.. pt. 3). — Obituary Notices of Sir R. Christison, Sir C. W. Thomson, C. R. Darwin, J. Decaisne, W. Gorrie, H. C. Watson.—Address on Chlorophyll by Prof. I. B. Balfour.—J. Stirton, 'Lichens from Newfoundland (*Roccella Grayi*, sp. n.), New Zealand (*Thysanophoron Pinkertoni*, sp. n.), and Scotland (*Lecidea erubescens*, sp. n.).' — A. Dickson, 'Germination of *Streptocarpus caulescens*' (1 plate). — Id., 'Monstrosity in *Iris Pseudacorus*.'—F. v. Mueller, '*Dysoxylon Schiffneri*, sp. n.'

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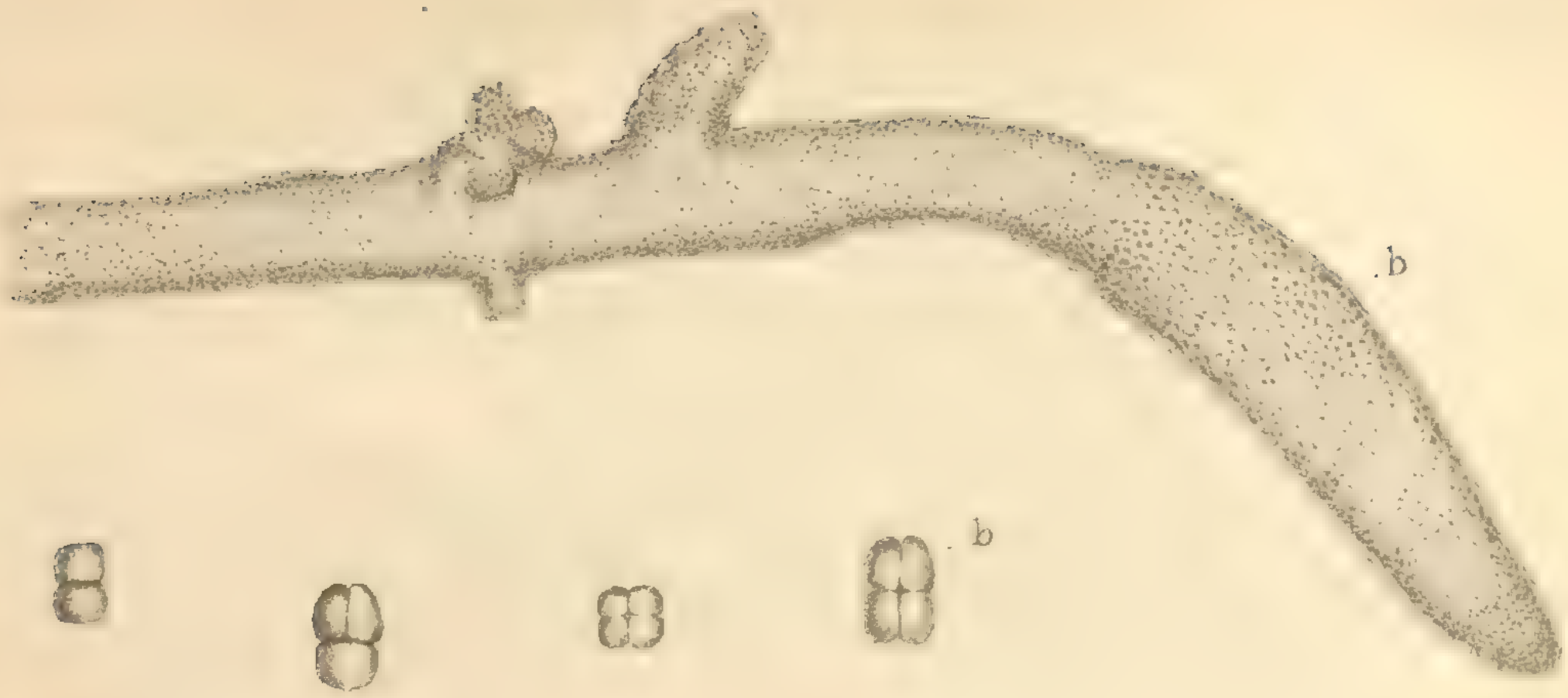

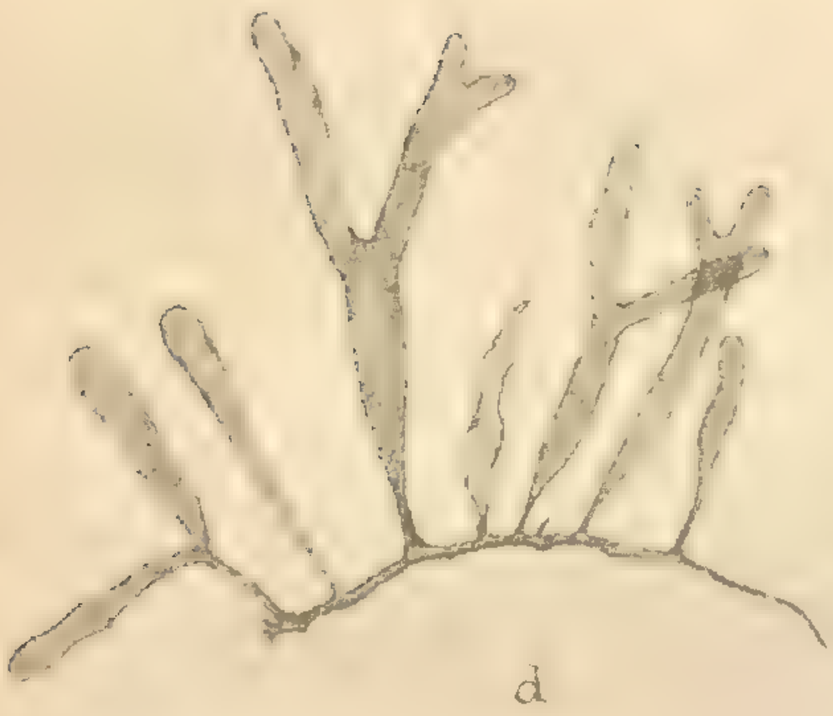

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Rhodymenia Nicæensis.

RHODYMENIA PALMETTA, Var. *NICÆENSIS*.

By E. M. Holmes, F.L.S.

(Plate 240.)

The seaweed which bears this name in Harvey's 'Phycologia Britannica' has hitherto been considered of somewhat uncertain affinity, owing to the fructification being imperfectly known and to the absence of any striking characteristic in the cellular structure of the frond.

Duby, who first described it in the 'Botanicon Gallicum' (ii., p. 942), named it *Halymenia Nicæensis*. Agardh, in 'Alg. Mar. Medit. et Adriat.' p. 153, 1842, referred it to *Rhodymenia Palmetta* J. Ag., as var. *β. Nicæensis*, distinguished from the type chiefly by the terete dichotomous threads, in which the apex of the frond frequently terminates, and which either dilate into new leaves or bear prolifications.

This arrangement was followed by Harvey in the 'Phycologia Britannica.' In that classical work he points out, however, that the plant bears a close resemblance to the var. *β.* of *Phyllophora Brodiæi* J. Ag. (*Phyllophora palmettoides* J. Ag.), but that it always springs from decumbent fibres. He adds that, while Mediterranean specimens have usually a quite simple frond prolonged at the apex into a cirrhous appendage, British specimens are more commonly forked, and their apices, though attenuated, are seldom produced into the characteristic appendages.

Kützing figures it in his 'Tab. Phyc.' xviii. t. 96, as *Sphærococcus Nicæensis*, and his illustration shows cystocarpic fruit near the base of the frond. The tetrasporic fruit has not, however, so far as I am aware, ever been described or figured; and on the characters afforded by this mode of reproduction must depend in some measure the position rightly assigned to the plant, since if the tetraspores were arranged in nemathecia it would apparently belong to the genus *Phyllophora*. Owing to the great similarity in the shape and structure of the frond to that of *Phyllophora palmettoides*, the two plants probably often pass the one for the other when the terminal cirrhi are absent and the fronds are collected without the root, which in the latter is a spreading disc and in the former a creeping stoloniferous prostrate stem.

In some specimens collected by Mr. E. Batters in company with myself at Hastings, in April last, I was so fortunate as to find tetraspores in the terminal filiform appendages. These were cruciate and scattered without order, and did not form a distinct sorus, as in *P. palmettoides*. The cystocarps were unfortunately so pressed in drying that their contents were lost, but, being situated near the base of the frond instead of towards the apex, as in *R. Palmetta*, the plant under consideration may, I think, be fairly separated, and provisionally retained as a distinct species under the name of *Rhodymenia Nicæensis*, until the structure of the

cystocarp can be ascertained. It may be here observed that, when the frond of *Phyllophora palmettoides* is examined under a low power ($\frac{1}{2}$ inch), it appears to be mottled with pale rounded spots. These are seen by careful focussing with a higher power (1-4th or 1-5th inch objective) to be caused by the shape of the large internal cells of the frond, which in this plant are rotundate-hexagonal, whereas in *R. Nicæensis* they are oblong-hexagonal. This difference in the shape of the internal cells is noticed by Prof. Agardh in the 'Epicrisis Floridearum,' p. 330, and this seems to me to indicate that the specimen of *Halymenia Nicæensis* with cystocarps, examined by him, may have been a specimen of *P. palmettoides*, since he states that the cystocarps have the structure of *Phyllophora*, and that the internal cells are shorter than those of *R. Palmetta*. Indeed, a sample I have received labelled *Halymenia Nicæensis* Duby, from Marseilles, which had cystocarps, proved to have the short or rounded hexagonal cells and mottled appearance, under the microscope, of *P. palmettoides*, and presented when moistened the incurved margins of the frond characteristic of that plant when growing, but which I have never observed in *R. Nicæensis*. Another specimen without fruit from the same locality presented branching lateral root-like fibres, different in character from the stolons of *R. Nicæensis*.

Kützing's figure of *Sphærococcus Nicæensis* represents the cystocarp as immersed in the frond, and not attached by a short pedicel as Agardh describes it. Kützing's figure exhibits also the characteristic creeping stem of *R. Nicæensis*. Dr. Hauck, however, is of opinion that there is in the Mediterranean a *Phyllophora* with creeping stem, which otherwise resembles *P. palmettoides*, and of this plant he has seen cystocarps, nemathecia, and antheridia. He has also met with a form of *R. Palmetta* with creeping stems in the Mediterranean, but with cystocarps evidently those of a *Rhodymenia*. These I have not seen. It is obvious, however, that the position of the tetraspores and cystocarps, and the creeping stem of Harvey's plant well distinguish it from *R. Palmetta*.

Explanation of Plate 240.—*a*, *Rhodymenia Nicæensis*, natural size, with terminal cirrhi. *b*, Cirrhus magnified, showing tetraspores *in situ*, and escaped from the frond. *c*, Fronds with immature cystocarps. *d*, Frond showing stoloniferous habit of growth.

NOTES ON BRITISH *DESMIDIEÆ*.—No. 2.

By W. Joshua, F.L.S.

Since my last notice (Journ. Bot. 1882, p. 300) I have to record the following species, most of which are rare, if not entirely new to our flora :—

Closterium calosporum Wittr. — This rare species with finely developed zygospores was present in fair abundance, with a few examples of *Penium digitus* also conjugated in a gathering made by

Mr. Roy from a moraine at Cammie, Aberdeenshire, on 2nd June, 1883.

C. lineatum Ralfs.—Bosullow, Cornwall, abundantly conjugated; though a common species, its zygospore is rare; has been observed in Ireland.

C. linea Perty. — With the large form of *C. Leibleinii* Kütz.; both with zygospores. Cammie.

Micrasterias fimbriata Ralfs, var. *ornata* Bulnh.—Slewdrum Bog, J. Roy.

M. conferta Lund. — North Glen, Sannox, Isle of Arran; also Cammie.

M. brachyptera Lund.—Lindeth, near Bowness, Westmoreland. New to Britain.

Euastrum insulare Wittr.—Minety, Wiltshire.

E. inerme.—Sannox, Arran, and Aberdeenshire.

Cosmarium exiguum Arch.—Ben-nachie.

C. cyclicum Lund.—Den of Gight, Aberdeenshire. Var. *arcticum* Nordst.—Minety, Wilts.

C. biretum Breb., var. *trigibberum* Nordst., 'Desmidieæ Arctoæ,' 1875, t. vii. 19. — Rain-water pool, Overley, near Cirencester. Angles more produced than in the Spitzbergen species. New to Britain.

C. Schliephackeanum Grun. f., *spitzbergensis* Nordst., 'Desmidieæ Arctoæ,' t. vi. f. 15.—Fyvie, Aberdeenshire.

C. plicatum Reinsch.—Strachan, N. B. Large form, rare.

C. quadrifarium Lund.—Goat Fell, Arran.

C. sublobatum Arch.—Den of Gight; and Haytor, Dartmoor.

C. obliquum Nordst.—Den of Gight, and Pennycuick.

C. pseudarctoum Nordst.—Den of Gight.

C. notabile f. *minus* Wille.—Den of Gight.

C. pachydermum Lund., β. *minus* Nordst.—Den of Gight.

C. bicrenatum Nordst.—Den of Gight.

C. sportella Breb.—Den of Gight. Large form.

C. annulatum Näg.—Fyvie.

C. Reinschii Arch.—Chyanhall Moor, Penzance.

C. Turpini Lund.—Bangor; and Driffield Woods, Wilts.

C. anceps Lund.—Den of Gight.

C. Holmiense Lund., β. *integrum* Lund.—Den of Gight.

C. globosum Bulnh.—Strachan, N. B.

C. Nymanianum Grun.—Alton, Hants; and Cornwall.

C. rectangulare Grun. = *C. Gotlandicum* Wittr. — Among Algæ from Hulgarvon Moor, Bodmin.

C. Bæckii Wille.—Penzance.

Arthrodesmus tenuissimus Arch.—Ben-na-Chie, N. B.

A. bifidus Breb.—Very abundant on water-plants, Fyvie.

A. Incus Hass., β. *intermedius* Wittr. — Abundantly conjugated. Cammie, N. B.

Zanthidium Robinsonianum Arch. — Derrytrasna Bog, Co. Armagh. Conjugated abundantly; zygospores delicately furcate, tuberculose. No. 550, fasc. 11, Wittrock & Nordstedt, 'Algæ Exsiccatæ,' comm. W. Joshua. This is, as far as I know, only the second occurrence of this fine species.

Z. octocorne Ralfs. β. — "Old Road," Aboyne. Zygospores have been seen here by Mr. Roy; only station known.

Staurastrum Meriani Reinsch. — This I have observed in many Scotch gatherings, always isolated.

S. acarides Nordst., 'Desmid. Spetsb.,' 1872. — Alva Glen, Stirling, A. Croall. This is a most interesting addition to our British list; it differs slightly from Nordstedt's form, being rather longer in proportion to its breadth than his.

S. orbiculare (Ehr.) Ralfs, β. *extensum* Nordst. — Den of Gight, N. B. With zygospores; in gelatinous stratum on rocks.

S. pilosum Näg., f. *minor*.—Driffield, Wilts.

S. Maamense Arch. = *S. pseudocrenatum* Lund. — Birse More, Aboyne, from *Myriophyllum* squeezings, J. Roy. A very interesting and unique species.

S. pileolatum Breb.—Den of Garrol; Bovey Tracey, Devon.

S. Capitulum β. *amænum* Hilze.—Strachan; Dartmoor.

Penium lagenaroides Roy, n. sp.—Isle of Arran.

P. crassiusculum De By.—Craigendennie Rocks, N. B.

P. spirostriolatum Barker.—Derrytrasna Bog, Co. Armagh.

P. (Cylindrocistis) **spinospermum**, mihi.—Derrytrasna Bog, Co. Armagh. Has long been known as an isolated form, but the identification of the sporangium completely separates it from *Mesotænium* or *Spirotænium*, which divide obliquely this species at right angles. The zygospore in this species is very remarkable, as the members of this genus whose zygospores are known have these bodies smooth; this seeming abnormality, however, simply shows the close affinity between this genus and *Cosmarium*, the latter having sometimes smooth zygospores, sometimes spinous, and sometimes intermediate, as in *margaritiferum*, which has a series of elevations on its surface.

Spirotænia muscicola De By. = *S. bryophila* Breb. — Wet rocks, Den of Gight. This has only been gathered once in the British Islands, and that time in Ireland; its zygospore is unknown. 569, Wittr. & Nordst. 'Algæ Exsiccatæ,' fasc. 12.

Docidium coronatum Breb.—Among *Spirogyræ*, Bangor.

Sphærozosma (*Spondylosium*) *pulchellum* Arch. — Fyvie, on mosses. Showing the stipitate form of plant.

S. (*Spondylosium*) *filiforme* Ehr.—Slewdrum Bog.

Cosmocladium constrictum Arch.—Aboyne, J. Roy. This singular species I have found before at Penzance attached in perfect groups. Also a doubtful *Cosmocladium*, a minute species with ripe zygospores abundant. It appears to differ from *Cosmocladium* in that the connecting threads are single, not double as in that genus.

C. saxonicum Rabt. — This has been found by Mr. Roy in same locality as above, but I have not hitherto seen specimens. From our present knowledge of this genus, it will hold undoubtedly a true position among *Desmidieæ*.

CINCHONA LEDGERIANA.

By Dr. Otto Kuntze.

To maintain the supposed species *C. Ledgeriana* Moens, Dr. Trimen attempts (p. 131) to controvert two of my statements, upon which my hybridity theory of that plant is based; but he (1) seems to me to contradict his own former statements, and (2) draws an erroneous conclusion from the opinion of one of his correspondents.

(1.) Dr. Trimen wrote in this Journal for 1881 (p. 321):—

(*a*.) "In our own plantations in Sikkim, after years of neglect as one of the troublesome and hopelessly variable forms of *C. Calisaya*, the plant [*C. Ledgeriana*] is now the object of careful cultivation." And (p. 322), "In India it was not distinguished from other yellow bark trees [= *C. Calisaya* and descendants], and it is only in the last few years that the trees have been picked out and identified by their botanical characteristics."

(*b*.) "In Java, too, it was soon observed that though showing a good deal of variation." "Seed from the latter [*C. Ledgeriana*] has not hitherto been found to come very true." (Journ. Bot. 1881, p. 322).

Dr. Trimen now writes (p. 132):—

"There are no *C. Ledgeriana* trees in the East that have been descended from Mr. Ledger's seed from the Rio Mamore."

"Its great variability exists only in Dr. Kuntze's imagination."

As the communications of the planters and intendants, who are often no botanists (as, for instance, Mr. Gammie and Mr. Moens), are not seldom contradictory, of which Mr. Gammie gives me a new proof, an exact botanist must judge chiefly from botanical researches; and I have proved that the *C. Ledgeriana* of Mungpo differs from the Bolivian descendants by shrubby habit and divaricate panicles with slender ramification,—two characteristics that can only originate from Mungpo specimens of the parents:—*C. Weddelliana* (*Calisaya*) with shrubby habit, and *C. Pavoniana* (*micrantha*) with slender panicles, which species grow in no other wise in Mungpo. Besides, Messrs. Gammie and Biermann had shown me, as the only *C. Ledgeriana* existing there, those shrubby or artificially tree-like *C. Ledgeriana* with slender panicles, and therefore Mr. Gammie gave me different information from Dr. Trimen; but the former information of Mr. Gammie, and that of the late chief gardener in the Mungpo plantations, Mr. Biermann, accords strictly with the above (1 *a*) given citations of Dr. Trimen, who may have got them from the Reports of the botanical superintendant of the Sikkim Cinchona plantations, Dr. King. The best proof of the hybridity of the Mungpo *C. Ledgeriana* lies in its botanical marks, as I have shown here, and more extensively in my monograph of *Cinchona*.

(2). If Mr. Christie, a planter, whose letter is partly cited by Dr. Trimen, had said that *isolated* trees of *C. Ledgeriana* were fertile

in the manner of other Cinchonas, there would be a contradiction to my statement in this Journal (p. 7), "*C. Ledgeriana* is the only *Cinchona* that suffers from sterility, and only ripens more fruits, if it gets fertilized and hybridized by other Cinchonas; that happens often . . .;" for it is well known that *C. Ledgeriana*, if not isolated from other Cinchonas, ripens many, but degenerated, seeds. If Mr. Christie *generally* writes, *C. Ledgeriana* comes perfectly true from seed, I find it contrary to my own numerous observations, to the testimonies of nearly all other planters, some of which I cited in this Journal (p. 7), and also to the former communications of Dr. Trimen, who wrote the above cited (1 *b*), and (Journ. Bot. 1881, p. 323), "The seedlings [from *C. Ledgeriana*], since Mr. Gammie uprooted nearly all the neighbouring trees, now come remarkably true, whereas before that was done the sporting was so great that Dr. King would not propagate by seed at all." This "remarkably true" is not *perfectly* true, which would be necessary for a species.

I never asserted that *C. Ledgeriana* was absolutely sterile; and if it gets few seeds by self-fertilisation, some of them may give true descendants. But the fertility, even if existing, cannot be an argument for a species in the genus *Cinchona*, because all artificial and all other spontaneous hybrids of *Cinchona* are extremely fertile. In regard to the fertility of *C. Ledgeriana*, Dr. Trimen confounds the facts of rich cross-fertilisation and poor self-fertilisation; his own plate of *C. Ledgeriana* shows partly abortive fruits, and confirms my observations and communications on the sterility of that plant.

CAMPYLOPUS BREVIFOLIUS SCHPR.

By H. Boswell.

At the latter end of July I paid a visit to Breconshire, in company with the Rev. Augustin Ley, hoping that we might haply find further traces of the *Bryum gemmiparum* of which mention was lately made in the Journal, and possibly come upon it in some other stream. This hope was disappointed, though we wandered in various directions and examined a great deal of ground, and all we saw of the *Bryum* was in the neighbourhood of the place where Mr. Ley first found it in May.

Nor can it be said that on the whole the region surrounding the Brecon Beacons is a very muscose one: many species that might be expected are conspicuous by their absence, especially *Orthotricha* and *Ulotæ*, whilst on the moors scarcely a trace of *Sphagnum* was seen in many miles.

The only thing of much interest, after the *Bryum*, was found on the last day of the ramble, on the bank of the Wye; this was a *Campylopus* which at first sight rather reminded me of *C. fragilis*, but with a different aspect from any form of that rather variable

species that I had seen. Arrived at home I soon found by the aid of the microscope that it was *C. brevifolius* Schpr. (Bryol. Eur. Suppl.), which appears to be the same thing as *C. subulatus*. Both names are appropriate enough: Dr. Braithwaite adopts the latter in his British Moss-Flora, now issuing. But *C. brevifolius* is described and figured as a very dwarfish species, and the specimens I possess from Forfarshire and the Continent were dwarfish enough, with a starved aspect quite agreeing with the description; while the Wye plants are about two inches high, freely grown, and forming large bold patches. The leaves, however, present no difference, but the habit and aspect are so different that it may be well to take notice of it as a rather remarkable variety, characterised thus :—

CAMPYLOPUS BREVIFOLIUS Schpr. = C. SUBULATUS ejusd.

Var. ELONGATUS.

Tufts broad, extended, compact and solid; stems slender, filiform, elongate, copiously radiculose below, repeatedly innovating with fastigiate branches above; branches without radicles. Leaves as in minor forms.

In sandy mud by the Wye, near Builth, growing in company with *Tortula cylindrica*, *Trichostomum tophaceum*, *Hypna*, &c.; 28th July, 1883.

In all its forms *C. subulatus* (or *brevifolius*) is readily known from *C. fragilis* by the shorter subula and narrower cells; from *C. Schimperi*, which it more resembles, by the absence of the diaphanous vesicular cells near the base. *C. Schwarzii* is more robust, and has large well-pronounced auricles.

SPICILEGIA FLORÆ SINENSIS: DIAGNOSES OF NEW, AND HABITATS OF RARE OR HITHERTO UNRECORDED CHINESE PLANTS.

By H. F. HANCE, Ph.D., Memb. Acad. Nat. Cur., &c., &c.

VIII.

1. *Clematis* (*Flammula*) *songorica* Bunge. — Ad Ha-mi, Turkestaniæ chinensis, Maio 1881, leg. W. Mesny. Agrees well with a Sai-sang-nur specimen of Bongard's.

2. *Thalictrum Fortunei* S. Moore.—Circa Wu-hu, prov. An-hwei, Maio 1881, leg. T. L. Bullock. The fruit of this plant is so much narrower and more compressed, so attenuated at the base, and so deeply furrowed, whilst that of typical *T. baicalense* Turcz.! (Regel, Uebers. d. gattung Thalictrum, t. 2, f. 2) is ovoid, and with slightly raised ribs on an even surface, that I cannot possibly believe it to be a variety of that species, as M. Maximowicz has, though not without much hesitation, regarded it (Ad fl. As. or. cognit. melior. Fragm. 3). And, both in Hancock's original Ningpo specimens, and in the present ones, I find the stipules either very sparingly or

not at all fimbriate. The flowers are pale lilac, and, as remarked by Mr. Moore, the habit is much like that of *T. orientale* Boiss.!

3. *Ranunculus* (*Hecatonia*) *Cymbalaria* Pursh. — Juxta Ha-mi, Turkestaniæ chinensis, Maio 1881, leg. W. Mesny.

4. *Melodorum* (*Eumelodorum*) *verrucosum* Hook. fil. & Thoms.— In dicione Hung-mo, territorii indigenarum ins. Hai-nan Lai dictorum, d. 23 Nov. 1882, leg. rev. B. C. Henry. Perfectly similar to the Khasia plant. Mr. Henry describes the flowers as cream-coloured, and with a very sweet fragrance.

5. *Eruca sativa* L.— Hami, Turkestaniæ chin., Maio 1881, leg. W. Mesny.

6. *Lepidium* (*Lepidiastrum*) *latifolium* L. — Circa Ha-mi, Turkestaniæ chin., Maio 1881, leg. W. Mesny.

7. *Dianthus* (*fimbriati*) *superbus* L. — Prope Chin-kiang, prov. Kiang-su, m. Aug. 1880, leg. T. L. Bullock.

8. *Saponaria Vaccaria* L.—Ad lacum Ko-ko-nor, leg. W. Mesny, a. 1881.

9. *Camellia* (*Thea*) *caudata* Wall. — In jugo Lo-fau-shan, prov. Cantonensis, m. Sept. 1882, coll. rev. E. Faber. I have no other Chinese specimens in my herbarium.

10. *Abutilon Avicennæ* Gærtn. — Ad Wu-hu, prov. An-hwei, Maio 1881, certe spontaneam invenit Bullock.

11. *Nitraria Schoberi* L. — Ad Ha-mi, Turkestaniæ chin., leg. W. Mesny, Maio 1881.

12. *Geranium sibiricum* L.—Ad Ha-mi, Turkestaniæ chin., Maio 1881, coll. W. Mesny.

13. *Xanthoxylon schinifolium* S. & Z. — In monte Dagoba, Chi-fu, d. 9 Sept. 1880, leg. F. B. Forbes. Not to my knowledge hitherto gathered out of Japan.

14. *Ilex* (*Euilex*) *rotunda* Thunb. — Prope Shek-kok, secus fl. Lien-chau, 308 m. p. a Cantone, d. 20 Octobris 1881, leg. rev. B. C. Henry. "An immense tree, with spreading branches. Not previously met with south of Central China."

497 15. **Ilex** (Euilex) **myriadenia,** sp. nov. — Frutescens, ramis teretibus ramulisque acute angulatis cinereis, foliis coriaceis elliptico-lanceolatis calloso-crenato-serratis cuspidato-acuminatis supra lucidis subtus opacis et confertissime glandulosis penninerviis nervis tenuibus subtus leviter prominulis circ. 3 poll. longis 1¼ poll. latis petiolo 3–4 lineali acute marginato, cymis femineis pedunculo 2 lin. longo fultis 3-floris, pedicellis 3 lin. longis, calyce pluridenticulato, drupis ellipsoideis lucidulis 4 lin. longis, stigmate inconspicuo sessili cruciatim quadrilobo rarius integro, pyrenis 4 dorso profunde unisulcatis.

In colle juxta fl. Lien-chau, prope pagum Ma-po-shui, 340 m. p. a Cantone, d. 26 Oct. 1881, leg. rev. B. C. Henry. (Herb. propr. n. 22120.)

This is, I think, more nearly allied to the North Brazilian *I. petiolaris* Benth.! and *I. vismiifolia* Reiss.! than to any Asiatic species in my herbarium.

16. *Sabia japonica* Maxim. — Secus fl. Lien-chau, prov. Cantonensis, Aprili 1882, fructiferam invenit rev. B. C. Henry. A

comparison with Mr. Hancock's Ning-po specimen, identified by Maximowicz (Ad. fl. As. or. cogn. mel. fragm. 7), proves that my *S. Bullockii*, described in the first fasciculus of these 'Spicilegia,' must be reduced to this. As, like some species of *Smilax*, the plant blossoms whilst the leaves are still quite immature, it is not easy to match flowering and fruiting specimens. A capital revision of the species of the Malay Archipelago has been given in Prof. Miquel's posthumous work 'Illustrations de la flore de l'archipel. indien.'

17. *Medicago* (*Falcago*) *sativa* L. — Ad Ha-mi, Turkestaniæ chin., m. Maio 1881, coll. W. Mesny.

18. *Melilotus* (*Cœlorutis*) *dentata* Willd.—Ad Ha-mi, Turkestaniæ chin., Maio 1881, leg. Mesny.

19. *Astragalus* (*Euhypoglottis*) *Laxmanni* Pall. — Ad Ha-mi, Turkestaniæ chin., Maio 1881, legit W. Mesny. I doubt if *A. tibetanus* Benth.! is specifically distinct.

20. *Glycyrrhiza uralensis* Fisch.? — In Turkestania chinensi, juxta urb. Ha-mi, fructiferam, a. 1881, leg. W. Mesny. I refer the specimen with some little hesitation to this species, very briefly characterised by DeCandolle (Prodrom. syst. nat. regn. veg. ii. 248), and which was totally unknown to Ledebour (Fl. ross. i. 566). It has been found recently in the Tien-shan mountains (Osten-Sacken & Ruprecht, Sertum Tianschanic. 42). As stated by the late Dr. Ruprecht, the legume is not moniliform; though turgid over the seeds, and compressed between, there is no constriction, the two margins being quite even, and when soaked in boiling water, the legume is anfractuose, as he describes it, or inclined to twist from right to left. It is downy, and besides clothed with short fungiform glands, and the stem is not unarmed, but furnished with short asperities. If Mr. Mesny's plant is not referable to Fischer's species, it must be new.

21. *Glycyrrhiza asperrima* L. fil. — Juxta Ha-mi, Turkestaniæ chin., m. Maio 1881, leg. cl. W. Mesny. In flower only, but I have no doubt referable to this species, and most certainly very distinct from the preceding one.

22. *Alhagi kirghisorum* Schrenk.—Juxta lacum Ko-ko-nor, leg. W. Mesny, a. 1881.

23. *Vicia* (*Eurvicia*) *sativa* L. — Ad Ha-mi, Turkestaniæ chin., Maio 1881, leg. W. Mesny.

24. *Lathyrus* (*Orobus*) *palustris* L. — In ora Koreensi leg. Bushnell; circa Hakodate, a. 1861, Dr. Albrecht; in montosis prope Ning-po, æst. 1872, coll. Swinhoe. All these specimens appear to me to belong to the typical form, rather than to the var. *myrtifolius*, and agree thoroughly with wild Pennsylvanian specimens.

25. *Lathyrus palustris* L., γ. *linearifolius* Ser.—Ad Chi-fu, prov. Shan-tung, a. 1881, leg. W. W. Perry.

26. *Sophora* (*Gabelia*) *alopecuroides* L. — Circa Ha-mi, Turkestaniæ chin., copiose, Maio 1881, W. Mesny.

27. *Pterolobium indicum* A. Rich.—Ad ripas fl. Lien-chau, juxta pagum Sai-ngou, 350 m. p. a Cantone, d. 21 Oct. 1881, leg. rev. B. C. Henry. The fruit is somewhat different in outline from that

figured by Wight (Ic. pl. Ind. or. i. t. 196), but Sir Joseph Hooker assures me the Indian and Chinese plants are identical.

28. *Bauhinia* (*Phanera*) *Championi* Benth. — Ad angustias Yeung-tui, fl. Lien-chau, 290 m. p. a metropoli, d. 12 Oct. 1881, leg. rev. B. C. Henry. I record this locality for the purpose of noting that every specimen gathered had cordate-ovate undivided leaves. In the Hongkong plant the leaves are usually divided to about one-third of their length, but I have specimens in which some few of them are either simply emarginate or even quite entire. I had always hitherto supposed, and indeed observed, that the amount of leaf-division was an exceedingly stable character in this genus, and Mr. Baker has (Fl. Brit. Ind. ii. 278) adopted it for the divisions of the section *Phanera*. In the present case, at any rate, it is not of specific value even.

29. *Lysidice rhodostegia* Hance. — Secus fl. West River, infra pagum Mo-lam, d. 9 Junii 1882. leg. C. Ford. The only specimens of this ever seen by Mr. Sampson and myself were small shrubs three to four feet high. Mr. Ford, however, finds it attain the height of seventy feet, with a trunk three feet in diameter at two feet above the ground. He adds that the bracts are white before the expansion of the flower. The natives told him the seeds are eaten.

30. *Tamarindus indica* L. — Ad Hoi-hau, ora septentr. ins. Hai-nan, vere 1879, coll. T. L. Bullock.

7609 31. **Rubus** (Malachobatus, elongati) **Fordii**, sp. nov. — Ramulis subcompressis tomento incano floccoso derasili tectis aculeis raris parvis recurvis munitis, foliis e basi cordata ovatis acuminatis leviter serratis serraturis calloso-mucronatis utrinque 2–4-sinuato-lobulatis lobulis basalibus reliquis magis conspicuis supra opacis præter costam leviter tomentosam glaberrimis subtus dense incanis nervis tenuibus rectiusculis supra impressis subtus elevatis et tomento floccoso derasili tectis petiolo floccoso-tomentoso aculeis paucis minimis armato 8 lin. longo, stipulis ?, racemi terminalis pauciflori efoliati rachi pedunculis calycibusque cinerascenti-tomentosis aculeis acicularibus glandulisque stipitatis densissime obsessis, pedunculis $\frac{1}{2}$–1 pollicaribus, calycis 5-partiti lobis 5 lin. longis ovatis spinoso-mucronatis intus cinereo-tomentosis inermibus, petalis ?, drupeolis numerosis oblongis dorso convexis facie planis saturate rubris 2 lin. longis stylo uncinato brevissime coronatis.

In prov. Cantonensi, secus fl. West River, d. 18 Maii 1882, coll. C. Ford. (Herb. propr. n. 22172.)

A very distinct species, in some respects akin to *R. Parkeri* Hance, but different in the form of leaves, the vestiture of them and of the stem, the inflorescence and numerous drupelets.

32. *Pirus* (*Pirophorum*) *Calleryana* Dcne.—Juxta fl. Lien-chau, prov. Cantonensis, m. Oct. 1882, fructiferam leg. rev. R. H. Graves. Quite like specimens gathered by me at Amoy, in October, 1857.

33. *Pirus indica* Wall. — In montosis secus fl. Lien-chau, prov. Cantonensis, m. Sept. 1881, leg. rev. B. C. Henry. I am quite unable to follow Sir Joseph Hooker (Fl. Brit. Ind. ii. 369) in

recognizing the genus *Docynia*, established by my lamented friend the late Prof. Decaisne: indeed I feel no little hesitation in admitting it even as a section apart from *Malus*. The present species is referred to *Cydonia* by both Spach and Roemer (Fam. nat. regn. veg. syn. monogr. 218), but the fruit, which I have examined in a fresh state, is a true apple in every respect. It is made into a preserve by the natives. In his remarkable dissertation on *Spiræeæ* (Act. hort. Petrop. vi. 105, sqq.), M. Maximowicz appears to me to have most happily solved the difficult question of the limits of *Rosaceæ* and *Saxifragaceæ* (Cfr. Hook. & Thoms. Journ. Linn. Soc. ii. 54; A. Gray, Mem. Amer. Acad. vi. 375), by the establishment of his well-defined order *Pomaceæ*. Nor, though I am aware Sir J. D. Hooker holds a different opinion, does it seem to me that there is any solid ground for objection to the genera he has separated from *Spiræa*. All M. Maximowicz's work is distinguished by its thoroughness and unpretentious learning.

34. *Potentilla Sanguisorba* Willd.—Circa Chi-fu, a. 1881, coll. W. W. Perry. I have been much surprised to find this eminently Arctic species extend so far south as the Shan-tung promontory, but there is no doubt of the correctness of my determination, both from Lehmann's figure (Monogr. gen. Potent. t. 5), and also from comparison with the specimens gathered at the River Kolyma by Augustinowicz. The plant is not glabrous, but slightly downy (Cfr. Trautvetter, Act. hort. Petrop. v. 50). The Chi-fu flora is well worthy of extended study, and I hope my valued friend F. B. Forbes, than whom no one is more capable, will elucidate it thoroughly. Debeaux's 'Florule' is at once pretentious and imperfect.

(To be continued.)

ON THE FLORA OF INNISHOWEN, CO. DONEGAL.

By H. C. Hart, B.A.

(Concluded from p. 278).

Alnus glutinosa Gært.—At Knockglass, west of Malin.

Quercus Robur L.—Innishowen Head; Glengad Head, and elsewhere on the coast.

Corylus Avellana L.—Common.

Juniperus communis L.—Sea-cliffs at Culdaff and Malin, Dickie; above Goorey, west of Malin. Var. *nana* occurs on the shore at Doagh Island; on Coolcross Mount, &c.

Orchis mascula L. and *O. latifolia* L.—Frequent, W. E. H.

O. maculata L.—Abundant, W. E. H.

Gymnadenia albida Rich.—Near Greencastle, W. E. H.; and elsewhere.

Habenaria viridis Br.—On a low hill at Malin, Dickie; about Culdaff in two or three places, not infrequent.

H. chlorantha Bab.—Frequent, W. E. H.; marshy ground near Carrickatrahy Castle, Doagh Island.

Listera ovata Br.—Leenane; banks above the sea at the east of Glennagiveney Bay.

L. cordata Br.— Erris, near Dunree; Bulbein Mount, 'Flor. Ulster'; above Lough Naminn at the south-east corner; Stoolary, south of Carndonagh, and probably frequent in suitable situations; Kilderry and Fahan, W. E. H.

Iris Pseud-acorus L.—Abundant, 730 feet, on Crockaughrim.

**I. fœtidissima* L.—Banks at Culmon Point, near Londonderry, Dr. Moore, Ord. Surv. Rept.; by the stream near the bridge at Carndonagh,

Allium ursinum L.—Glengoleen, W. E. H.; Ned's Point, Buncrana.

Endymiom nutans Dum.—Frequent, W. E. H.

Narthecium Ossifragum Huds.—Common.

Juncus maritimus Sm.—Estuary at Culdaff; Malin estuary; not common.

J. effusus L., and *J. conglomeratus* L.—Common. The former form grows very large about the Farland Point.

J. acutiflorus Ehrh.—Frequent.

J. lamprocarpus Ehrh., and *J. supinus* Mœnch.—Common.

J. squarrosus L.—Abundant. To the summit of Slieve Snacht, 2019 feet.

J. compressus Jacq.—Plentiful, chiefly *J. Gerardi.*

J. bufonius L.—Abundant.

Luzula sylvatica Bich.— Common; rarely, as at Innishowen Head, in open heathy places at low levels.

L. campestris Willd.—Frequent.

L. multiflora Lej.—Common.

[*L. pilosa* Willd.—I am doubtful about this species occurring in Donegal; I have not recently been able to meet with it, but my visits have usually been too late in the year.]

Alisma Plantago L.—Local, W. E. H.; marshy places on Doagh Island.

A. ranunculoides L.—Boggy ground by Lough Foyle, near Derry, Dr. Moore, Ord. Surv. Rept.

Triglochin maritimum L., and *T. palustre* L.—Frequent.

Sparganium ramosum Huds.—Frequent. Scarcer to the north, but plentiful near Malin R. C. Chapel.

S. simplex Huds.—Ballyarnet Lough, Dr. Moore, Ord. Surv. Rept.

S. natans L.—Lough Drimly, near Culdaff, Dickie; in a bog-hole in Mamore Gap; Ballyarnet Lough, Dr. Moore.

S. minimum Fries.—Lough Fad, in the Mintiaghs; Lough Inn River, near the lake.

Lemna minor L.—Common.

Potamogeton natans L.—Common.

P. polygonifolius Pourr.—Common.

P. pusillus L.—About Burnfoot, on Burt and Inch Road.

P. pectinatus L.— Abundant in ditches in Inch and Blanket-nook estuaries; along the line from Inch Road to Bridge End, and

about the embankments, in brackish ditches and partially reclaimed swamp-holes.

P. heterophyllus Schreb.—Plentiful in Loughinn River, near the lough.

Ruppia maritima L.—Abundant along shores of Lough Foyle, *Flor. Ulst.*; Malin Estuary; at Blanket Nook by the embankment.

Zostera marina L.—Abundant in the still upper parts of Loughs Foyle and Swilly.

Zannichellia palustris L.—Sparingly between Inch and Burnfoot.

Schœnus nigricans L. — Innishowen Head; Glengad Head; Malin Head, &c., and inland in boggy places, frequent.

Cladium Mariscus Br.—Lough Naminn.

Rhynchospora alba Vahl.—Bog at Culmore Point, near Londonderry, *Flor. Ulst.*; in a bog east of Lough Fad in the Mintiaghs; between Lough Inn and Lough Fad, East Innishowen.

Blysmus rufus Link.—Side of the Foyle near Brookhall, *Flor. Ulst.*

Eleocharis palustris Br.—Scarce northwards, marshy ground near Carnickatrahy Castle on Doagh Island; Lough Inn in East Innishowen; near Buncrana; Inch Island, on the south side.

E. multicaulis Sm.—Plentiful in many parts of Malin Head, where it is a characteristic plant; at 900 feet, west of Slieve Main; abundant about Lough Naminn and Lough Fad in the Mintiaghs, and occasionally viviparous and rooting again at the florets in a curious manner.

Scirpus maritimus L.—Kilderry, W. E. H.; at Ardmalin South, on the west side of Malin Head; at Blanket Nook.

S. lacustris L.—At Lough Naminn and at Lough Inn.

S. Tabernæmontani Gmel.—Plentiful at Blanket Nook; near the light-house at Innishowen Head, Dickie.

S. cæspitosus L.—Abundant.

S. fluitans Hook.—Plentiful at Lough Naminn; Lough Inn River and Lough, East Innishowen, in great plenty.

S. setaceus L.—Plentiful in the district of Innishowen, Dickie. This remark applies rather to the following species. *S. setaceus* grows near the Signal tower at Malin Head, in company with *S. Savii*.

S. Savii S. & M.—Stroove, &c. Common in Innishowen.

Eriophorum vaginatum L. and *E. angustifolium* Roth.—Common.

Carex dioica L.—Marshes at Malin Presbyterian Church, Dickie.

C. pulicaris, L.—"The sward near the shore at Culdaff is chiefly composed of this plant," Dickie; Bulbein Mount; Crockaughrim, at 500 feet.

C. arenaria L.—Common.

C. vulpina L. — Beach at Innishowen Head, island of Innishtrahull, &c., Dickie; plentiful in many places from Inch to Burnfoot and Blanket Nook, on Lough Swilly.

C. remota L. — Rare in Donegal; Farland Point; and Blanket Nook, Lough Swilly.

C. stellulata Good.—Abundant.

C. ovalis Good.—Rare in Donegal, Farland Point.

C. stricta Good.—By Loughinn River, and at the Lake.

C. rigida Good.—Common on Bulbein Mountain, where it was discovered by R. Brown. Dr. Dickie gathered a plant near the sea-level at Innishowen Head, which, he says, seemed to belong to this species. I did not meet with it, and suppose the plant seen to have been *C. flava*.

C. vulgaris Fr.—By the side of several of the lakes.

C. panicea L.—Common.

C. limosa Linn.—Gap of Urris, Mr. C. Moore, 'Cyb. Hib.' By this locality is meant probably the Gap of Mamore, in Erris Mountain, Innishowen. I have not been able to find this sedge there, though I have repeatedly searched for it. I believe I gathered the leaves of this species by Loughinn River, near the Lough, but it seems to be very rare in Donegal. My specimens were insufficient to determine.

C. præcox Jacq.—Leenane Station. Probably common.

C. pilulifera L.—Bulbein Mountain.

C. glauca Scop.—Common.

C. flava L.—Common. Very plentiful, though stunted, at Malin Head.

C. extensa Good.—Side of the Foyle, at Culmore, 'Cyb. Hib.'; very sparingly near the Signal Tower, Malin Head.

C. fulva Good. (*C. Hornschuchiana* Hoppe.)—Abundant in Innishowen district, Dickie. I could not find it.

C. distans L.—Innishowen Head, and Island of Innishtrahull, Dickie; Greencastle, Glengad Head, and at the extreme north of Malin Head; about Inch Road and Burnfoot, frequently.

C. binervis Sm.—Abundant.

C. ampullacea Good.—Common.

Anthoxanthum odoratum L.—Abundant, at the summit of Slieve Snacht, 2019 feet.

Phalaris arundinacea L.—Ditches between Inch Road and Bridge End; not a common plant.

Phleum arenarium L.—Between Greencastle and Innishowen Head.

Alopecurus pratensis L.—Frequent.

A. geniculatus L.—At Malin Head in several places.

Nardus stricta L.—Common.

Phragmites communis Trin.—Common.

Psamma arenaria R. & S.—Frequent.

Agrostis canina L.—Common.

A. vulgaris With.—Common. *A. pumila* Lightf. occurs on the summit of Slieve Main, at 1550 feet; *A. vulgaris* at the summit of Slieve Snacht, 2019 feet.

A. alba L.—Frequent.

Holcus lanatus L.—Common.

Aira cæspitosa L.—Common.

A. flexuosa L.—Abundant. At the summit of Slieve Snacht, 2019 feet.

A. caryophyllea L., and *A. præcox* L.—Frequent.

Avena pubescens L.—Coast at Innishowen Head, Dickie.

Arrhenatherum avenaceum Beauv.—Abundant.

Triodia decumbens Beauv.—Frequent. A very dwarf, prostrate form occurs in patches at Malin Head abundantly.

Koeleria cristata Pers. — Innishowen Head, Dickie; Dunargus, on the west side of Malin Head.

Melica uniflora Retz. — Shady rocks near the Presbyterian Church at Malin, Dickie.

Molinia cærulea Mœnch.—Abundant.

Poa annua L., and *P. pratensis* L.—Common.

P. trivialis L.—Frequent.

P. compressa L. — In several places on the old walls of Derry, 'Cyb. Hib.' Only known in two other localities in Ireland.

Glyceria fluitans Br.—Common.

Sclerochloa maritima Lindl. — Estuary at Culdaff; Ardmalin; Inch Island, on the south side.

S. loliacea Huds. — Coast at Innishowen Head, and at Culdaff, Dickie.

Catabrosa aquatica Presl. — Marshes a little east of Culdaff, Dickie; west of Malin, by the estuary.

Cynosurus cristatus L.—Frequent.

Dactylis glomerata L.—Common.

Festuca sciuroides Roth. — Old walls at Bally Griffin; coast at Malin, Dickie.

F. ovina L. — Common. At the summit of Slieve Snacht, 2019 feet.

F. rubra L.—Common round the coast.

F. sylvatica Vill.—Ned's Point, Buncrana.

F. gigantea Vill.—Near Carndonagh.

F. arundinacea Schreb. — Coast at Innishowen Head, Dickie; ditches about Bridgetown, and abundant in Blanket Nook.

F. pratensis Huds.—Frequent.

Bromus asper L.—Near Fahan.

B. mollis L.—Common.

Brachypodium sylvaticum R. & S.—Frequent.

Triticum repens L.—Common.

T. junceum L.—Doagh Island; Dunree.

Elymus arenarius L. — Sandy shores north from Innishowen Head, Dickie. This probably stands for Glennagiveny Bay, where the species grows in some quantity. I could not find it elsewhere in Innishowen.

Lepturus incurvatus Trin.—Very rare; in the mud at the mouth of the river below the bridge at Buncrana. I have not met with this grass elsewhere in the north of Donegal.

Lolium perenne L.—Common.

Equisetum umbrosum Willd.—Very rare. At Culdaff, Dickie.

E. maximum Lam.—Glennagiveny Bay; Blanket Nook, and on reclaimed lands near Burnfoot.

E. sylvaticum L.—Frequent; at sea-level at Farland Point.

E. limosum L.—Common.

E. palustre L., and *E. arvense* L.—Frequent.

Polypodium vulgare L.—Common.

Lastræa Oreopteris Presl.—Plentiful in glens, as along the Straid River; woods near Carndonagh.

L. Filix-mas Presl., and *L. dilatata* Presl.—Common.

L. æmula Brack. — Frequent; Innishowen Head, &c.; woods near Carndonagh.

Polystichum aculeatum Roth. — Plentiful on Crockaughrim, and with it the form *P. lobatum* occurs, having a close resemblance to Holly Fern.

P. angulare Newm. — About Goorey, west of Malin, local, W. E. H.

Cystopteris fragilis Bernh. — Bulbein Mount, one plant, 1879; on Coolcross at about 870 feet, in one place looking north-east in a rocky crevice. A very rare fern in Donegal.

Athyrium Filix-fœmina Roth.—Common.

A. Adiantum-nigrum L.—Frequent above Goorey School-house.

A. Trichomanes L.—Rare; plentiful on Crockaughrim; Bulbein Mount.

A. marinum L.—Greencastle, Innishowen Head, and northwards in many places. Especially plentiful at the extreme point of Malin Head. Innishtrahull, Dickie.

A. Ruta-muraria L.—Rare, W. E. H.

Scolopendrium vulgare Sm.—Local, W. E. H,; about Fahan and Carndonagh, very scarce.

Pteris aquilina L.—Abundant.

Blechnum boreale Sw.—Abundant.

Hymenophyllum Wilsoni Hook. — Gap of Mamore, and on the Erris Mountains; Innishowen Head, W. E. H.; Coolcross.

Osmunda regalis L. — Very rare in Innishowen. At Culdaff, Dickie; I was only able to hear of three or four plants having been found in this district, and I believe they have all been gathered. I saw it nowhere, to my great surprise, for it is abundant in Lough Swilly.

Botrychium Lunaria Sw. — Local, W. E. H.; north side of the river at Culdaff, Dickie; at Leenane.

Ophioglossum vulgatum L. — Kilderry, W. E. H. Leenane, very abundant.

Isoetes lacustris L. — Lough Naminn and Lough Fad, in the Mintiaghs; Lough Fad, East Innishowen.

Lycopodium clavatum L. — Frequent, W. E. H.; Stoolary Hill, about three miles south of Carndonagh; from 800 to 900 feet on the south side of the Scalp.

L. alpinum L.—Summit of Slieve Main, S.W. of Slieve Snacht, at 1550 feet.

L. Selago L. — Frequent. At sea-level, close to it, at Malin Head.

L. selaginoides L. — Abundant on wet sandhills near the sea at Culdaff and Malin, Dickie; on Doagh Island, by the shore; Crockaughrim and Bulbein Mount; plentiful on sandy ground between Buncrana and Fahan.

Supplementary Notes.

Since writing the foregoing account of the botany of Innishowen I have, through the assistance of Mr. More, obtained access to a collection of dried plants with localities from Donegal, made in 1839 by Mr. Charles Moore, now Director of Botanic Gardens at Sydney. From these I have extracted the following notes relating to Innishowen. The specimens were examined by Mr. More and myself.

Crambe maritima L.—"On the strand, Point of Norway, parish of Clonmanny."

Arenaria trinervia L.—"In shady natural woods of townland of Ballygrattan, parish of Upper Moville." An addition to the flora of Co. Donegal.

Arabis hirsuta Br. — "Shores of Lough Swilly, at Ballynany [Ballyannan ?], parish of Desertigny."

Prunus Padus L.—"Mintiaghs."

P. Cerasus L.—"Roadside, Nuff."

Ligusticum scoticum L.—"Norway Point, Clonmanny."

Carum Carui L.—"Townland of Ballyliffin, Clonmanny." Not a native.

Carduus acanthoides L.—"Roadside near Culdaff."

Hieracium vulgatum Fr. (*gothicum*)—"Rocks at Urris Gap."

Anchusa sempervirens L. — "Churchtown, Upper Fahan." Not a native.

Mertensia maritima Don.—"Norway Point."

Veronica montana L. — "Along shore, Ballylammon, Upper Moville."

Ligustrum vulgare L.—"Glen, south side of townland of Ridford, parish of Culdaff." Not a native.

Populus tremula L.—"Binnion."

Euphorbia portlandica L.—"Rocks of Sale, Binnion; and rocks of Kockamany, parish of Clonca."

Parietaria officinalis L.—"Walls of Redcastle, Upper Moville."

Polygonum Raii Bab.—"Clonca and Culdaff."

Festuca sciuroides Roth.—"Church of Clonmanny."

Avena pubescens L.—"Rocky ground in a glen called Farghanogh, parish of Lower Fahan."

‡*Lolium temulentum* L. — "Townland of Claggan, parish of Culdaff; not uncommon."

Polypodium Phegopteris L. — "Mintiagh Glen, Altohill, Crockaughrim."

Polystichum aculeatum Roth.
Lastræa Oreopteris Presl. } "Mintiagh."

Botrychium Lunaria Sw. — "Side of Lough Swilly, near Burnfoot."

ON THE FALL OF BRANCHLETS IN THE ASPEN (*POPULUS TREMULA*).

By Samuel G. Shattock, F.R.C.S.*

The ready fall of the branchlets in the Aspen (*Populus tremula*) is a sufficiently remarkable occurrence among the larger exogenous trees to merit a close investigation, and with this object the following account may not be wholly without interest.

In the exogenous trees, with scarcely any exceptions beyond those to be noticed, and of which the Aspen is the most remarkable, the death of a branchlet is followed, indeed, by its ultimate detachment, but only after the lapse of a long period, during which the wood of the dead part undergoes changes which render it so friable or brittle that it is readily snapped across by the first violence that befals it; if of considerable size, perhaps, by its sheer weight. It may be sufficient to say, for the present purpose, that in this process of usual detachment the living parenchyma of the bark, the cork alone excepted, furnishes by transverse partitioning a line of cork and underlying phellogen, by which the living part is abruptly demarcated off from the dead; in some circumstances a similar demarcation ensues in the pith and medullary rays, the woody prosenchyma and bast-fibres alone remaining continuous, the dead with the living. The parenchyma of the dead part shrinks; the cork is in consequence circularly fissured, and the dead parenchyma subsequently softens and is washed away under the influence of rain and wind, leaving the stump of denuded wood still attached to the living branch; the dead wood at the same time becomes so brittle as to fracture on the first violence and complete the separation of the dead parts. The immediate cause of this brittleness of the dead wood the microscope shows to be an extreme thinning and confluence of the woody cells and vessels. After the separation of the dead woody stump, the fractured surface is covered by an overgrowth of new tissue produced from the cambium, the new tissue undergoing transformation into wood, at first of a modified kind, and a proper cortical system. By the progressive advance of this tissue the broken surface, though never healed, is covered in. In this process no vital changes are set up by which the dead wood of the dead part is cast off from the living, and the actual surface of the fractured wood remains unhealed.

The other process of fall has been named by Berkeley† "Cladoptosis." In a short communication, one of a valuable series, Berkeley notices this fall as occurring in the white willow and oak. I have observed the same in both trees; but he does not mention the Aspen, in which the process is most marked, and the details of the process, with which the present communication is concerned, he did not investigate. In the following account I will limit

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* Read before the Linnean Society, Jan. 18th, 1883.

† 'Gardeners' Chronicle,' Sept. 8th, 1855.

myself to the Aspen, but in the oak and willow the changes are of a similar kind. In the larger branches of the Aspen the process does not occur, but branchlets half an inch in diameter and below this readily allow of this peculiar separation from their parent branch. Externally, the union of the branchlet with the branch offers to view a marked enlargement, comparable with that which is seen at the base of the petioles in exogenous trees or at the bases of other deciduous stalks. The swelling or enlargement is concentric with the branchlet; and it is through the middle of this that the disarticulation takes place, and where the secret of the process lies. A longitudinal section of the enlargement shows a general increase in the sectional area of the medulla, the wood, and cortical system; though indistinct, there is nevertheless a something in the wood across the middle of the enlargement which engages the eye; the wood is less white, and on probing with a needle an area is detectable which is markedly softer than the wood on either side; this area is from about 1-12th to 1-8th of an inch in breadth; it crosses the bark at right angles to the surface of the enlargement, but the wood with slight obliquity towards the parental branch, the zone being as a whole concave outwardly, or forming a very obtuse outward angle. If the bark be stripped off, the surface of the enlargement will be seen to present a series of longitudinal clefts, the woody elements being disparted by an intrusion of parenchyma. It is not that the woody tissue of the tree is peculiar, from any great natural and general shortness of the woody cells, or otherwise. Nor is it, again, that the death of the wood is itself the source of the separation. For if it be the terminal portion of a branchlet which dies, it remains without showing any tendency to this disarticulation, and its subsequent history is the same as that of the dead parts of other trees. On the contrary, if a branchlet be removed so as to leave, however, a stump devoid of buds, the part dies, and is cleanly separated across its base, in the same way as the petiole of a deciduous leaf is cast off if the lamina be artificially removed.

In the process of separation the branchlet is detached long before it presents the later signs of death; indeed it is difficult to believe sometimes that the fallen part has entered upon a total death; its leaves and buds may be still fresh upon it, and its bark not distinguishable by the eye from what is unequivocally alive. The enlarged base of such a recently fallen branchlet displays a soft pale yellow minutely granular surface, moist, and uniformly convex, except at the margin, which, with the fissured edge of the cork, is slightly raised. After the detached parts have become dry, the wood presents, instead of a continuous surface, a series of deep radiating clefts, the surface of the dried medulla is depressed, the wood convex, the bark concave, these changes being severally resulted from the drying and disappearance of the parenchyma which covers and interdigitates with the woody lamellæ. On the parent branch the corresponding surface acquires characters of a more permanent kind, and the resulting cicatrix is cupped, radially ridged in the situation of the wood and in a finer manner beyond,

and uniformly brown from changes in the cork which covers it. The cicatrizing process is peculiar, inasmuch as it occurs simultaneously in the whole of the surface; but I will refer to this again.

Now what does the microscope show regarding the structure of the articular enlargement? How does the area through which the disarticulation occurs differ from the rest of the branchlet? Two transverse sections prepared from wood hardened in alcohol, stained with magenta and glycerine, washed, and mounted in pure glycerine, show the following differences. The section of the branchlet displays a uniformly and deeply-stained wood, traversed by medullary rays (of cells in single rows), and perforated with vessels arranged with uniform irregularity, though slightly larger and in excess in the limits of the annual rings. The wood is succeeded by a lightly-stained cambium, then by an abundance of soft bast, in which lie groups of bast-fibres; through both of these the transversely elongated cells of the medullary rays are extended, and it is to the presence of these that the fine radial markings referred to in the cortex of the scar and separated branchlet are due; more outwardly is a larger-celled ground-tissue, bounded finally by phellogen and cork.

Contrasting with this, the section of the zone through which the disarticulation of the branchlet occurs presents almost solely a lightly-stained parenchymatous tissue, of cells square in section, intersected with the transversely elongated cells of medullary rays, and having the vessels arranged in radiating planes, instead of promiscuously as in the branchlet; the woody cells are very few, scattered in groups adjoining the vessels; in other sections the woody cells are quite absent; the cambium and cortical system offer nothing peculiar.

Longitudinal sections made through the enlargement show the wood to cease on either side of this parenchymatous zone, the vessels alone being continued uninterruptedly through it; the same section shows the parenchyma of the articular zone to be composed of longitudinally elongated cells crucially intersected by planes of similar cells which form the medullary rays. This absence of parenchyma and the free presence of vessels explains at once the readiness with which the branchlets admit of artificial detachment, and how it is that the construction of the parts allows of cell-changes by which a disarticulation may be effected similar to that which occurs in the active fall of a leaf.

The changes which precede and prepare the way for the fall of a branchlet are essentially the same as those which precede the fall of the leaf or other articulate organs. A circular fissure in the cork along the middle of the swelling is the first outward and visible sign of the process proceeding within. Longitudinal sections made in this stage exhibit beneath the microscope a transverse zone of cork already formed in the parenchyma of the swelling beneath the circular fissure in the general cork.

The bast-fibres and vessels of the wood pass through the new-formed cork, and are indeed the only structures which really connect the deciduous part with the parent branch; both are

ruptured by the first slight violence, but the surface of the branch thus rudely exposed is already healed throughout by the cork, the ends of the vessels and the bast-fibres alone excepted—these project unhealed in the scar, though eventually the periodic growth of the parenchyma and cork buries them beneath the surface. The process of healing is therefore quite different from that by which a fractured surface is closed over in other exogenous trees; in these it occurs, as before noticed, by the progressive advance of new tissue produced from the cambium.

Such is the structure of comparatively recent scars in the Aspen, but in time wood is formed in the parenchyma or ground-tissue of the scar beneath the phellogen and cork, in conjunction with, and as an extension of, the yearly addition of wood to the general surface of the branch; the ground-tissue produces a secondary wood-forming meristem in extension of the general cambium, which is normally continued around the parenchyma of the articular zone to the branchlet beyond, though these cambium cells do not under the ordinary circumstances produce woody tissue on the inner side, but furnish only the elongated parenchyma of the articular zone before described.

The reasons why the branchlets should be thus constructed, ready for such a disarticulation, and why they fall, are difficult to render. Very often the fallen parts appear healthy, and have their buds and even leaves fresh on them. Berkeley remarks, "The cause of death in the branches is uncertain, sometimes, perhaps, cold, or superior demand of other parts of the tree which divert that nourishment which was destined for their use." The fall occurs in the autumn; after the cell-changes at the articulation have occurred a gale may strew the ground with branchlets, as it will disarticulate leaves when ready for their fall; but the living process is a necessary antecedent to the detachment which does not own a purely mechanical causation.

Cladoptosis occurs in the other genus of the same natural order, *viz.*, in the willow; and it occurs also in the oak, the scars of which closely resemble those of the Aspen, and are similarly formed, not by an overgrowing of new tissue from the cambium, but by a simultaneous healing of the entire surface. Amongst trees not indigenous or acclimatized it occurs in some of the genera of the Artocarpaceæ, *Antiaris toxicaria* (Upas tree) and *Antiaris saccidora*, as well as in *Castilloa elastica*, the india-rubber tree of Central America.

But why of all trees these few should be so constructed it is, to say the least, difficult to offer suggestions. The natural history of the articulate stems of *Crassula arborescens* may furnish some clue by analogy. At times portions of this succulent will spontaneously fall without showing signs of an antecedent determining death, and such portions will spontaneously take root and propagate the plant—an event which is prone to happen when the nutritive demand and supply of the plant are unequal; the parent stem detaches portions of its growth, which afterwards find an independent mode of existence. And in the well known *Bryophyllum*

it is also true that leaves which spontaneously fall will produce buds and a crop of new plants, in the same way as will those which are prematurely removed by art for the same end. The process in fact is an adventitious means of propagation. And in the Aspen, as a mere conjecture, it may under circumstances be the same, but I have seen as yet no evidence of this. Or is the reason to be discovered from a study of arboreal evolution? Perhaps such a study might show the peculiarity to be the remains of a method of propagation, remains which now fulfil no end, yet persist as well-nigh useless relics of a bygone process. That the provision for such a separation is merely in anticipation of a death of the branchlets can scarcely be maintained, for such a death is of mere accident if it is only such as occurs in other trees, and in these no similar provision exists. In the animal organism the death of a part is followed by active cell-changes which lead to its complete separation; but I believe there is no instance of an original and abiding peculiarity of structure in any part, in anticipation of a death which is to be determined solely by accident.

ON THE FLORA OF SOUTH BEDFORDSHIRE.

By James Saunders.

(Continued from p. 178).

Specularia hybrida A. DC.—Abundant in cornfields.

Vaccinium Myrtillus L.—Limited to the lower greensand range, where it is abundant.

Calluna vulgaris Salisb.

Pyrola minor L.—Very rare. Woods at Pepperstock and Aspley.

Monotropa Hypopitys L.—Local. Under beech trees, Markham Hills, by the New Mill End Road.

Fraxinus excelsior L. *Ligustrum vulgare* L.

Vinca minor L.—Local. Limbury. New Mill End.

Erythræa Centaurium Pers.

Chlora perfoliata L.—Abundant on the lower chalk escarp.

Gentiana Amarella L.—Abundant over the chalk district.

Menyanthes trifoliata L.—Very local. Leagrave Marsh, from which it is fast disappearing. Limbury; Flitton.

Convolvulus arvensis L. *C. sepium* L.

Cuscuta europæa Murr.—Local. Dumb Hills, Totternhoe.

Solanum Dulcamara L.

S. nigrum L.—Rare. Ampthill Woods.

Hyoscyamus niger L.—Local. Limbury.

Verbascum Thapsus L.

V. nigrum L.—Abundant on railway banks and waste places.

V. Blattaria L.—A casual on Hart Hill, F. Wiseman, 1878.

Scrophularia Balbisii Hornem.—Common near water.

S. nodosa L.

Digitalis purpurea L.—Local. Luton Hoo. Aspley.

Antirrhinum majus L.—Midland Railway, far from houses, Harlington.

Linaria Cymbalaria Mill.—Common on old walls.

L. Elatine Mill., and *L. spuria* are abundant in gravelly fields over the chalk district.

L. repens Mill.—Abundant on railways, often growing in the interstices of the bare chalk.

L. vulgaris Mill.

L. minor Desv.—Locally abundant. Leagrave. Barton.

Veronica hederifolia L.; *V. polita* Fries.; *V. agrestis* L.; *V. arvensis* L.; *V. serpyllifolia* L.; *V. officinalis* L.; *V. Chamædrys* L.; *V. Anagallis* L.; *V. Beccabunga* L. are all common.

V. scutellata L.—Very local. Limbury. Northall.

Euphrasia officinalis L. *Bartsia Odontites* Huds.

Pedicularis palustris L.—Not common. Flitwick Marsh. A small bog, Heath and Reach, Totternhoe Mead.

P. sylvatica L.—Rare. Someries. "Ampthill Heath," Abbot.

Rhinanthus Crista-galli L.—Common. *β. major*.—Rare. Chalky fields on Barton Hills.

Melampyrum pratense L. — Locally abundant. Pepperstock Woods. Aspley Woods.

Lathræa Squamaria L.—Local. Luton Hoo. "Whipsnade, Studham," Abbot.

Verbena officinalis L.—Local. Totternhoe, near Luton.

Lycopus europæus L.

Mentha sylvestris L.—Rare. A damp ditch, West Flitwick.

M. hirsuta L. *M. arvensis* L.

Thymus Serpyllum Fries. *T. Chamædrys* Fries. Both occur, but I have no notes as to their relative frequency.

Origanum vulgare L.—Common.

Calamintha Clinopodium Spenn. *C. Acinos* Clairv.

Nepeta Glechoma Benth.

N. Cataria L.—Local. Streatley. Leagrave.

Salvia Verbenaca L.—Local. Toddington.

Prunella vulgaris L. *Scutellaria galericulata* L.

Marrubium vulgare L.—Sundon Hills; probably an escape.

Ballota fœtida Lam.—Common.

Stachys Betonica Benth.; *S. palustris* L.; *S. sylvatica* L.

Galeopsis Ladanum L.—Frequent in cornfields.

G. versicolor Curt.—Abundant at Flitwick Marsh.

G. Tetrahit L.

Lamium amplexicaule L. *L. purpureum* L. *L. album* L.

L. Galeobdolon Crantz.—Locally common in the extreme south, and at Aspley.

Ajuga reptans L.

A. Chamæpitys Schreb.—Abundant in several cornfields on the lower chalk escarp. Barton. Streatley.

Teucrium Scorodonia L.

Echium vulgare L.—Abundant in waste places and land out of cultivation.

Lithospermum arvense L.—Locally abundant south of Luton.

Myosotis cæspitosa Schultz; *M. palustris* With.; *M. arvensis* Hoffm. *M. versicolor* Reich.—Local. Near Luton. Heath and Reach.

Anchusa arvensis Bieb.—Probably limited to the lower greensand district.

Borago officinalis L.—Abundant on one part of Flitwick Marsh, but probably an escape.

Symphytum officinale L.—Locally abundant near water. Sharpenhoe. Flitwick.

Hottonia palustris L.—Rare. Potton, Miss Higgins.

Primula vulgaris Huds.—The variety *caulescens* is not uncommon in Sundon and Toddington Woods.

P. veris L.—Abundant.

[*Lysimachia vulgaris* L.—Not observed further south than the R. Ouse.]

L. Nummularia L.—Abundant in moist places.

L. nemorum L.—Local. Aspley. Chiltern Green.

Anagallis arvensis L.—Common.

A. tenella L.—Rare. Bog, Heath and Reach. Totternhoe Mead.

Plantago major L. *P. media* L. *P. lanceolata* L.

P. Coronopus L.—Local. Limited to the arenaceous strata. Heath and Reach. Ampthill.

Chenopodium candicans Lam.; *C. album* Reich.—Near Luton; *C. viride* L.—Flitwick.

C. Bonus-Henricus L.—By the River Lea, south of Luton.

Atriplex angustifolia Sm.

A. erecta Huds.—Cardington, J. McLaren. Brammingham.

Rumex nemorosus Schrad.; *R. obtusifolius* Andr.; *R. crispus* L.; *R. Acetosa* L.; *R. Acetosella* L.

R. maritimus L.—Rare. New Mill End, on the banks of the River Lea.

R. aquaticus L.—By the River Ousel, Leighton.

Polygonum Fagopyrum L.—Too frequent to be omitted.

P. aviculare L.; a. *agrestinum*; b. *vulgatum*.—Luton, Woburn; c. * *arenastrum*.—Farley Bottom, R. A. Pryor.

P. Hydropiper L.—Local. Clophill, Flitwick.

P. amphibium L., and var. *terrestre*.—Local. Harlington Ponds, Woburn Park.

P. minus Huds.—Rare. In a ditch, Flitwick Marsh.

P. Bistorta L.—Very local. Moist meadow south of Luton, Abbott's only station for the south of the county.

Aristolochia Clematitis L.—Thoroughly naturalized in a wood, Luton Hoo.

Daphne Laureola L.—Local. Leagrave, New Mill End.

Euphorbia Helioscopia L.; *E. Peplus* L.; *E. exigua* L.

E. amygdaloides L.—Local in woods. Pepperstock, King's Wood, Flitwick.

Mercurialis perennis L.—During three successive seasons (1880–1882) this has blossomed in the late autumn.

(To be continued.)

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* See Journ. Bot. 1876, p. 26.

IN MEMORY OF THOMAS HUGHES CORRY.

It is happily but seldom that the pursuit of botany is attended with results so disastrous as those which we have had lately to deplore in the death of two Irish botanists—one of them already eminent in more than one branch of the science, the other, a comparatively recent student, but bidding fair to become a leading local authority. But the investigation upon which Mr. T. H. Corry and Mr. Charles Dickson were engaged terminated fatally and abruptly on Thursday, the 4th of August. On the morning of that day the two gentlemen went out in a boat upon Lough Gill, for the purpose of examining the botany of the islands in the lake. The weather was very boisterous, and the wind rough; the boat was upset, and the two botanists were drowned.

Mr. Charles Dickson had comparatively lately take up the study of botany, but gave much promise of distinguishing himself in local investigation, having good powers of observation. Of Mr. Corry it is not too much to say that he stood in the first rank of our younger botanists; and that the loss which our science has sustained by his death can hardly be over-estimated. The masterly paper upon the floral development and fertilisation of *Asclepias Cornuti*, which he read at the Linnean Society last December, within a fortnight of his admission to that body, and which has since been published in their 'Transactions,' at once established his position as a minute and careful observer. His shorter notes, principally upon Irish plants, most of which have appeared in this Journal, presented him in another light as a painstaking and energetic field botanist. Mr. Corry's first published botanical note seems to have been one recording his rediscovery of *Carex Buxbaumii* at Lough Neagh, published in 'Science-Gossip' for 1878, p. 187.

At the time of his death (at the early age of twenty-two), Mr. Corry—who held at Cambridge the post of Lecturer in Botany in the University Medical and Science Schools and to Girton College, as well as that of Assistant Curator of the University Herbarium—was a candidate for the post of Examiner in Botany to the Irish Board of Intermediate Education. A copy of his testimonials now before us gives a lengthy list of the honours which he had obtained. The following notice from the pen of his friend Professor Babington will, we are sure, be read with interest:—

"I cannot say too much in praise of my truly lamented friend Corry. It is quite unnecessary for me to say that he was an excellent physiological botanist, for his papers published by the Linnean and other Societies prove this. And from my personal knowledge I know him to have been exceedingly well acquainted with descriptive Botany. Indeed in this latter department he has been of the highest value to me. I lose in him not only an excellent scientific helper, but also a very greatly valued friend.

"He was an admirable and indefatigable worker; indeed he

often worked too hard for his health, which was never very strong during the time that I knew him. There are several points in which I do not know how we can supply his place at Cambridge. Irish Botany also loses quite as much as we do.

"I cannot close without bearing my testimony to the exceeding beauty of his character—modest and unassuming, so much so that his great attainments only became known on a very intimate acquaintance with him. The memory of such a pure and unselfish life is a bright legacy; very especially in the present day, when it is only too commonly found that young men seem to think and act as if their elders cannot know anything, from not having been educated in the so-called 'modern way.' Well will it be if the example so unfailingly set by our deeply lamented friend be followed wherever his name is known.

"He was also, as I have good reason to believe, fully prepared for the sudden change which removed him from faithful service here to the brighter service above.—C. C. Babington."

SHORT NOTES.

A New British Moss. — A short trip into Perthshire with my friend the Rev. J. M. Crombie, has added another species to our steadily increasing list of Mosses. It happened on this wise: on August 4th, sauntering over the moor near Tummel Bridge, I called my companion's attention to a fine rosy patch of *Bryum pallens* in the path, and stooping down I observed in the centre a little tuft of capsules of a different plant, which the lens at once showed me belonged to *Trematodon ambiguus* (Hed.) Hornsch., a species not hitherto recorded as British, though one quite to be expected, as it occurs sporadically all over Europe. There were only nine capsules in the tuft, three of them equally in the calyptrate, operculate, and peristomate condition; and although search was made all round, no more plants were seen, and wet weather prevented a more extended scrutiny further up the valley towards Kinloch Rannoch, the most likely direction for it. The *Trematodonteæ* constitute a subfamily of *Dicranaceæ*, remarkable for the long neck to the capsule, and represented in Europe by *Trematodon ambiguus*, *brevicollis* and *longicollis*, and the cleistocarpous *Bruchia Vogesiaca*, *Trobasiana* and *palustris*. As this family has just been completed in the 'British Moss Flora,'* a supplementary plate will be given at the end of the first volume, to include this and other novelties.—R. Braithwaite.

The Survival of the Fittest. — Referring to Mr. Baker's paper (pp. 271–4), the following figures may be of interest:—

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* [We regret to find that we have omitted to draw attention to the issue of part vii. of this admirable work, which seems to improve with each instalment. —Ed. Journ. Bot.]

1. Average "distribution" of the British species (Lond. Cat.)—

A. 73. B. 65. C. 44.

2. Percentage of British to exotic species in each class—

	Indigenons.	Introduced.	Aliens.
A.	61	12	5
B.	87	10	3
C.	8	11	4

Hence—1. Species which show the greatest tendency to spread at Kew are those which have in the course of time become most general in the British area. 2. British species have favourably competed with foreigners in their native conditions of temperature, &c. What causes the apparent weakness of *Ranunculus bulbosus*, its "distribution" being 89? Would not this method, if applied to such species in the list as are most commonly found in gardens, show a similar result in their favour when compared with the exotics?—Ernest G. Harmer.

Hybernacula of Utricularia.—Referring to Mr. H. C. Hart's note on *U. intermedia*, quoted at p. 246, I have noticed *U. minor* behave in the same way when growing in shallow water; when grown in deep water it behaves like *U. vulgaris*, as described by Darwin; and I suspect that the two modes of depositing the winter-bud are common to all our species, and result from the depth of water in which the plant occurs. I presume that the stems of *U. intermedia* do not survive the winter, and that the buds only "remain attached" until the stems decay in late autumn, as in the other species. Perhaps Mr. Hart would experiment on *U. intermedia* grown in deep water?—W. H. Beeby.

Myosurus minimus in "waste places."—In reply to Mr. Fryer's query (p. 280), I have seen this plant on gravelly banks adjoining the towing-path by the canal near Send, Surrey, associated with such plants as *Papaver Argemone*, *Spergula arvensis*, &c.—W. H. Beeby.

Cerastium holosteoides Fr.—This *Cerastium* occurred on each side of the River Cree, between two and three miles south of Newton Stewart, in Wigton and Kirkcudbright, typical examples being obtained from both places; but, as in specimens obtained from the Perth locality, the pubescence on the stem varied from the two characteristic lines to a more general diffused pubescence. The glabrous foliage and larger flowers, with the biennial growth, however, well mark the plant.—G. C. Druce.

Vicia Orobus DC. in E. Cornwall, and Cicendia filiformis Del. in N. Devon.—On Sept. 11th, while examining the plants of Greena Moor, in E. Cornwall, Mr. T. R. Archer Briggs and I found *Vicia Orobus* growing in considerable quantity in some rough furzy ground just above the right bank of a small stream flowing into the Tamar. It seemed confined to the drier spots, appearing chiefly in and around the tufts of *Ulex Gallii*, with *Viola lactea* and *Lathyrus macrorrhizus*. We saw perhaps a hundred plants in about an acre of ground, all past flowering and many with ripe fruit.

This first recorded Cornish station must be some fifteen miles or so from Mr. Husband's Devon station (the only one yet known for that county), the Bradworthy and Kilkhampton Road. On the following day (Sept. 12th) Mr. Briggs brought me *Cicendia filiformis* from two spots between Pyworthy and North Tamerton, on the Devon side of the Tamar. In one (a damp roadside) it extended for between twenty and thirty yards; but at the other (on a neighbouring common) it appeared only very sparingly. This was not accepted as a Devon plant by Watson, although he knew it to have been vaguely reported as such in 'Flora Devoniensis,' and elsewhere.—W. Moyle Rogers.

Liparis Loeselii Rich. in Cambridgeshire.—This rare plant, which seems to have been overlooked or not recorded from this county since 1863, still grows in some plenty on a moor in Prof. Babington's District 5, Burwell. As patches of from two or three to a dozen plants grow scattered over some acres of land, there seems no danger of its becoming lost to the Cambridgeshire flora at present.—Alfred Fryer.

Potamogetons new to Cambridge and Hunts. — *Potamogeton Zizii* M. & K., in abundance in the parishes of Chatteris and Welches Dam, in Cambridgeshire; and by Parsonware Drove, in the parish of Ramsey, Hunts. *P. decipiens* Nolte, plentifully in a fen-drain in Welches Dam, Cambs.; and rarely in the old Bedford River at Earith, Hunts. *P. flabellatus* Bab., in the tidal, sometimes brackish, waters of the New Bedford River, from Sutton gault to Witcham gravel, in Cambs.; and rarely in the old Bedford at Earith, Hunts.—Alfred Fryer.

NOTICES OF BOOKS.

The Botanical Record Club. Phanerogamic Report for the Years 1881 and 1882, by the Referees and Editor. Manchester: Printed by James Collins. 1883. Pp. 179–251.

This Report contains, as usual, a large amount of matter of great interest to those who study the geographical distribution of our British plants. It contains also critical notes of varying interest and importance, for which the Editor, Mr. F. A. Lees, is mainly responsible. We have no space for a detailed criticism, but may note two or three points in passing. A variety of *Veronica Anagallis* is named *glandulosa* by Mr. Lees, but seems from his description to have slender claims to a distinctive name. A long editorial note on *Orchis incarnata* seems to us likely to add to the misunderstanding already existing as to that plant—a misunderstanding which we do not think Mr. Clarke fully cleared up, and on which Mr. Corry was preparing a paper for this Journal at the time of his lamented decease. We doubt whether the plant so named in this Report is in all cases the true *incarnata;* and the date "July 5th" assigned to its flowering at Birkdale (Southport) is exceptionally late, it

being usually in full bloom in that locality by the middle of June. Mr. Lees returns to the charge as to the naming of *Carex pilulifera* var. *Leesii*, regarding which he seems to labour under a curious misconception. We doubt if anyone has said—certainly we have never done so—that a name may not be employed as a varietal one, if originally used a specific appellation, but it is a mistake to suppose that such a use is obligatory; and surely Mr. Lees cannot imagine that his "consent" could be necessary to the naming of the plant, or that the absence of such "consent" can justify him in saying that "the varietal title *Leesii* was improperly bestowed."

We are surprised to find that Dr. Boswell and Mr. Lees regard the Gloucestershire *Lycopodium complanatum* as merely *L. alpinum*, although they differ in their estimate of its position, Dr. Boswell thinking it "pure and simple *L. alpinum*," while Mr. Lees considers it as a "peculiar form" of that species, and (p. 200) further distinguishes it as "a plane-leaved, lax non-fastigiate *Var.*" Mr. Carruthers, who drew up the description of the plant published in this Journal for 1882 (p. 322) has at our request kindly re-examined the specimen, and carefully compared it with the large series of foreign specimens in the British Museum Herbarium; he has no hesitation in referring it to *complanatum*, in which opinion, it will be remembered, Prof. Babington and Mr. Baker coincide.

The heading "New County Records" is likely to mislead those who do not understand it in the sense of the Club as including records "additional to 'Topographical Botany' and the Record Club Reports, 1873–1880." Thus many of Mr. Ridley's Radnorshire plants (Journ. Bot., 1881, 170–174) appear here as "new county records" on the authority of the Rev. A. Ley; so with the Rev. W. M. Rogers's N. Devon Plants (J. Bot., 1882, pp. 9–16), and Mr. Druce's E. Perth plants (Id., pp. 80–83); as well as with such plants as *Erythræa capitata*, *Cineraria spathulæfolia*, and many more —*e. g.*, *Salix Smithiana*, here recorded for N. Somerset as new, but included by Mr. Baker in his list of Somerton plants (J. Bot., 1875, p. 360). Readers of this Journal, to many of whom the Record Club Reports are inaccessible, would do well to note that *Carex rigida*, recorded from East Perth by Mr. Druce (in J. Bot., 1882, p. 82), is "doubtful," while Mr. Roper's *Agrostis setacea* (J. Bot., 1881, p. 373) is correctly referred by Mr. Lees to *Festuca ovina*. We may add that Mr. Roper informs us his *Lepidium ruderale* in the same paper should be *L. satirum*.

We venture to think it would lend additional value to the Report were the plants of certain groups handed over for naming to those who are known to have paid special attention to them. Mr. Arthur Bennett, for instance, is as identified with the Potamogetons as are the Messrs. Groves with the Charas, and their opinion upon plants of these groups would be of special value.

Among the "aliens, casuals, and escapes" may be noted records of *Potentilla norvegica* from Middlesex, Hertfordshire, and South-West Yorkshire; and *Anthoxanthum Puelii* from Herefordshire. These two plants seem likely to become permanent additions to our Flora.

Under the title 'The Student's Guide to Structural, Morphological, and Physiological Botany' (J. A. Churchill & Co.) Prof. Bentley has issued a compact little volume intended to "serve as an introduction to the author's 'Manual of Botany,' and other larger and more comprehensive works." Much care has been exercised in bringing the book up to date; the illustrations are numerous and well executed; and the volume cannot, we think, fail to be of great service as an introduction, not only to "larger works," but to the study of the science of which it treats.

The recently issued part (fasc. xc.) of the 'Flora Brasiliensis' concludes the *Gramineæ*, the *Andropogoneæ* and *Tristegineæ*, of which it consists, being undertaken by M. E. Hackel.

Dr. Cooke has issued the concluding part of the second volume of his 'Illustrations of British Fungi,' with index to vols. i. and ii. It is intended to proceed forthwith with the publication of the 'Illustrations' of the remaining sections of *Agaricus*, which it is estimated will occupy two volumes similar in extent to those already issued. We regret to learn that the work does not receive the support which it certainly deserves, which probably accounts for the somewhat high price charged for the Index number.

The second number of vol. xii. of 'English Botany' (No. 85 of the whole work) succeeds the first with commendable promptitude. It contains five new plates—*Lastrea Thelypteris*, *L. remota*, *L. uliginosa*, *L. glandulosa*, and *L. æmula*—showing so marked an improvement upon the remainder, especially those of the old 'English Botany,' that we regret that there are not more of them.

Messrs. Cassell & Co. have begun a reissue of Mr. Britten's 'European Ferns.'

Those botanists who are interested in the relations between insects and flowers should take note that the two papers on the subject read by Mr. A. W. Bennett and Mr. R. M. Christy before the Linnean Society (summarised at pp. 219, 220) have been published by that body in the Zoological portion of the 'Journal' (No. 100). We must suppose that the Council had some reason for so doing, but it seems to us that they would have been more in place in the Botanical section of the 'Journal.'

Mr. T. R. Archer Briggs sends us a second instalment of his 'Queries in Local Topographical Botany,' reprinted from the 'Transactions of the Plymouth Institution' for 1882–83. We have before expressed our opinion (Journ. Bot. 1882, p. 376) of the great usefulness of papers of this kind; and having noticed the first part somewhat at length, it is only necessary to say that the second is equal to it in value and interest. It is mainly occupied with the *Umbelliferæ* of Devon and Cornwall, the history of *Physospermum cornubiense* as a British plant being especially interesting.

From Prof. Sereno Watson we have received part xi. of his useful 'Contributions to American Botany,' which contains the conclusion of the list of Dr. Palmer's South-Western Texas and North Mexico plants, and a 'Description of some new Western species.' In the former paper two new genera of *Liliaceæ*—*Glyphosperma* and *Hemiphylacus*—are established.

Under the title 'Finland: its Forests and Forest Management,' Dr. J. Croumbie Brown has published (Oliver & Boyd, Edinburgh) the third of a series of volumes, the publication of which has been undertaken as a contribution to the literature of Forest Science. Like its predecessors, it is an interesting and readable compilation, containing much information about the subject of which it treats.

New Books. — L. F. Vukotinović, 'Formæ Quercinum Croaticorum' (8vo, pp. 24, tt. 10). — A. Kerner, 'Schedæ ad Fl. Exsicc. Austro-Hungaricam' (Vienna, Frick: pp. iv., 175).—N. Patouillard, 'Tabulæ Analyticæ Fungorum' (Poligny, Gindre: Fasc. i., 8vo, 40: tt. 32).—F. Gustave & F. Héribaud-Joseph, 'Flore d'Auvergne' (Clermont-Ferrand, Thibaud: 12mo, pp. xlviii., 576).—O. Kuntze, 'Phytogeogenesis' (Leipzig, Frohberg, 1884: 8vo, pp. xvi., 213).

Articles in Journals.—September.

American Naturalist. — I. P. Gratacap, 'Growth of Plants in acid solutions.'—M. E. Jones, 'New Plants' (*Cymopterus corrugatus* and *Iva nevadensis* from Nevada, *Cereus maritimus* from Mexico, spp. nn.).

Ann. Sciences, Nat. (6th S., xvi., Nos. 1, 2 & 3: August). — J. Constantin, 'Étude comparée des tiges aériennes et souterraines des Dicotylédons' (tt. 8).—R. Zeiller, 'Fructifications des Fougères du terrain houiller.'

Botanische Zeitung (Aug. 31 & Sept. 7). — M. Büsgen, 'Die Bedeutung des Insektenfanges für *Drosera rotundifolia*.'—(Sept. 14). W. Detmer, 'Ueber die Enstehung stärkemnbildender Fermente in den Zellen höherer Pflanzen.' — (Sept. 21). O. Warburg, 'Ueber Bau und Entwickelung des Holzes von *Caulotretus heterophyllus*.'

Botanisches Centralblatt (Nos. 35–38). — J. E. Weiss, 'Das monkständige Gefässbündelsystem einiger Dikotyledonen in seiner Beziehung zu den Blattspuren.'

Botanisk Tidsskrift (13 band, 3–4 hæfte). — N. H. Bergstedt, 'Bornholms Flora,' part i. — C. Jensen, 'Analoge Variationer hos Sphagnaceerne.'

Botaniska Notiser (haft. 4).—B. Jönsson, 'Normal förekomst af masurbildningar hos slägtet *Eucalyptus*' (1 plate). — Id., 'Polyembryoni hos *Trifolium pratense*.'

Garden (Sept. 1). — *Elæocarpus cyaneus* (ic. pict.) — (Sept. 8). '*Dendrobium nobile*, var. *nobilius*' (ic. pict.). — G. Nicholson, 'The

Sophoras.' — (Sept. 15). 'The Trumpet Daffodils' (ic. pict.).*— (Sept. 22). C. Maries, 'Rambles of a plant-collector' (in Nepaul).

Gardeners' Chronicle (Sept. 1). — *Sarcanthus belophorus* Rchb. f., sp. n.; *Cypripedium tonsum* Rchb. f., sp. n.; *Phalænopsis Valentini* Rchb. f., n. sp. (hyb. nat.?). — J. G. Baker, 'Species of *Tulipa*' (concl.). — J. B. Armstrong, 'The Southern Alps of N. Zealand' (contd.). — W. B. Hemsley, '*Rubus Leesii* and Mr. Culverwell's Hybrid Raspberry.' — (Sept. 18). *Masdevallia gemmata* Rchb. f., *M. Gaskelliana* Rchb. f., spp. nn. — *Doronicum plantagineum*, var. *excelsum* (fig. 43). — J. B. Armstrong, 'The Southern Alps of N. Zealand.' — (Sept. 15). *Coelogyne salmonicolor* Rchb. f., sp. n. — M. Foster, 'Notes on Irises (contd.). — A. S. Wilson, 'Potato Diseases' (*Peziza postuma* Berk. & Wils., sp. n.: fig. 50). — (Sept. 22). *Sigmatostalix malleifera* Rchb. f., *Masdevallia trichochæte* Rchb. f., *Zygopetalum forcipatum* Rchb. f., spp. nn.—P. MacOwan, '*Broomeia*' (fig. 58).—M. Foster, 'Notes on Irises' (contd.).

Journal of Linnean Society (Sept. 24). — P. T. Cleve, 'Diatoms collected during Nares' Arctic Expedition.' — J. C. Howard, '*Cinchona Calisaya*, var. *Ledgeriana*, How., and *C. Ledgeriana* Moens.' — H. N. Ridley, 'New or rare Monocotyledonous Plants from Madagascar' (*Polystachya rosellata*, *P. minutiflora*, *Cynosorchis gibbosa*, *C. grandiflora*, *Xerophyta spinulosa*, *Drimia Cowanii*, *Fimbristylis cinerea*, *Rhynchospora leucocarpa*, *Acriulus* (n. gen.) *madagascariensis*, *A. griegifolius* (Angola), *Fintelmannia setifera*, spp. nn.). —R. A. Rolfe, '*Selagineæ*' described by Linnæus, Bergius, Linn. fil., & Thunberg' (*Selago nigrescens*, *S. Dregei*, *S. capituliflora*, *S. congesta*, spp. nn.).—J. G. Baker, 'Recent additions to Flora of Fiji' (many new species). — C. B. Clarke, 'On *Hemicarex* and its allies' (1 plate: many new species). — W. T. T. Dyer, 'New Economic products received at Kew.' — I. B. Balfour, 'A New *Pandanus*' (*P. Joskei*).

Midland Naturalist. — W. B. Grove, 'Mycological Notes.' — J. E. Bagnall, 'Flora of Warwickshire' (*Campanulaceæ—Apocyneæ*).

Naturalist. — W. West, 'Plants of Malham.' — H. Boswell, '*Campylopus brevifolius*.'

Œsterr. Bot. Zeitschrift. — T. F. Hanansek, 'Ueber eine Monstrosität der Blüthe von *Campanula rotundifolia*.' — B. Blocki, '*Veronica multifida*.'—K. F. Jordan, 'Ueber Abortus, Verwachsung, Dedoublement und Obdiplostemonie in der Blüthe.' — A. Degen, 'Zur Flora von Pressburg.' — P. G. Strobl, 'Flora des Etna' (contd.).

Science-Gossip.—H. W. Kidd, 'Fasciated Stems.'—G. H. Bryan, Botany at the English Lakes.

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* We cannot refrain from drawing attention to the great beauty of this and many of the coloured plates in the 'Garden.' As specimens of colour-printing they seem to us in advance of most productions of the kind.

SPICILEGIA FLORÆ SINENSIS: DIAGNOSES OF NEW, AND HABITATS OF RARE OR HITHERTO UNRECORDED, CHINESE PLANTS.—VIII.

By H. F. Hance, Ph.D., Memb. Acad. Nat. Cur., &c., &c.

(Continued from p. 299).

35. **Illigera rhodantha**, sp. nov. — Ramulis striato-sulcatis hirtellis, foliolis 3-nis breviter petiolulatis elliptico-oblongis basi subcordatis apice obtusiusculis chartaceis utrinque opacis præter nervos pubentes glabris nervis venisque subtus prominulis subtus oculo armato glandulis minutis albis dense obsitis, paniculis erectis remote multifloris, calycis tubo fulvo-tomentoso, petalis roseis 4–5 lin. longis extus puberis, staminodiis cucullatis, fructibus pubentibus 4-alatis 2 poll. latis medio 1¼ poll. altis alis 2 majoribus apice obtusis 3–4 lin. latis 2 reliquis brevissimis.

Secus fl. Lien-chau, prov. Cantonensis, fff. d. 5 Oct. 1881, frf. Apr. 1882, super rupes scandentem, invenit rev. B. C. Henry. (Herb. propr. n. 22072.)

No doubt a very near ally of *I. dubia* Spanoghe. The sepals and petals are much longer than those of *I. pulchra* Bl.!, and the wings of the fruit more attenuated than in *I. Kurzii* C. B. Clarke!, where they are also only two. Mr. Henry describes it as a beautiul creeper, with profuse bright rose-coloured flowers.

36. *Woodfordia floribunda* Salisb. — Ad fauces Shiu-hing, secus fl. West River, prov. Cantonensis, d. 6 Maii 1882, coll. C. Ford. These are the only wild Chinese specimens I have seen.

37. *Epilobium* (*Chamænerion*) *angustifolium* L. — Ad Hami, Turkestaniæ chin., Maio 1881, coll. W. Mesny.

38. *Hydrocotyle javanica* Thunb. — In jugo Lo-fau-shan, prov. Cantonensis, sub exitu m. Sept. 1882, leg. rev. E. Faber. Now, so far as I know, first recorded from China.

39. *Bupleurum falcatum* L., β. *scorzoneriifolium* Ledeb. — Circa Chin-kiang, prov. Kiang-su, m. Aug. 1880, leg. Bullock.

40. *Angelica decursiva* Franch. & Savat. — In ins. Formosa, prope Tam-sui, m. Maio 1882, fructibus onustam, invenit am. T. Watters. Only hitherto recorded from Japan.

41. **Viburnum** (Euviburnum, Lantana?) **Fordiæ**, sp. nov.— Frutescens, ramis junioribus inflorescentia petiolisque dense gilvo-stellato-tomentosis, foliis chartaceis ovatis v. rhombeo-ovatis basi obtusis v. rotundatis apice acutiusculis a medio ad apicem sinuato-dentatis dentibus callosis supra vix lucidulis secus costam tomentosis subtus pallentibus opacis glandulosis costa nervis trabeculisque stellato-tomentosis ad utrumque latus parallele 5–6 costulatis costa costulisque supra impressis subtus prominulis 1½–2½ poll. longis 1–1½ poll. latis petiolo 3–5 lineali, corymbis axillaribus et terminalibus pedunculatis folium adæquantibus v. superantibus 5-radiatis radiis ramulosis multifloris, floribus breviter pedicellatis 2 lin. diametro, calycis extus stellato-pilosi dentibus obsoletis, corollæ rotatæ extus pilosæ intus glaberrimæ lobis ovalibus obtusis ciliatis,

staminibus corolla dimidio longioribus glaberrimis, stylo brevissimo stigmate faucem attingente, drupa . . . . ?

In silvis ad Ting-ü-shan, prov. Cantonensis, secus fl. West River, d. 6 Maii 1882, coll. C. Ford. (Herb. propr. n. 22086.)

I believe I have rightly placed this exceedingly neat-looking species; but, in the absence of young specimens to show the buds, and of fruit to exhibit the structure of the putamen, it is not possible to decide with certainty. I have named it for Mrs. Ford, the constant assistant of her husband in the preparation of the results of his fruitful explorations.

42. *Patrinia* (*Eupatrinia*) *ovata* Bunge. — Ad fl. Lien-chau, prov. Cantonensis, m. Octobri 1882, leg. rev. R. H. Graves. A remark of that capital botanist Mr. C. B. Clarke (Fl. Br. Ind. iii. 210) first led me to compare my *P. graveolens* with the description and figure given by Bunge forty-eight years ago of his *P. ovata* (Pl. monghol.-chin. decas. 23, t. 2), and there is no doubt they are identical. Like many other instances given in the present compilation, the species extends from the extreme north to the south of the Empire.

43. *Patrinia* (*Atrinia*) *scabiosifolia* Fisch. — Juxta Shui-kwan, secus fl. West River, prov. Cantonensis, in umidis solatis, Apr. 1882, invenit C. Ford; ad fl. Lien-chau, m. Oct. 1882, coll. rev. R. H. Graves.

44. *Gynura angulosa* DC. — Circa Tam-sui, ins. Formosæ, Januario 1882, coll. T. Watters. I am told by Mr. Watters that this is largely grown by the Chinese as an esculent vegetable.

45. *Centaurea* (*Centaurium*) *Amberboa* Lam., γ. *glauca*. — Juxta lacum Ko-ko-nor, a. 1881, invenit W. Mesny.

45. *Centaurea* (*Acroptilon*) *Picris* Pall. — Circa Ha-mi, Turkestaniæ chin., Maio 1881, leg. W. Mesny.

47. *Taraxacum Dens-leonis* Desf.—Ad Ha-mi, Turkestaniæ chin., Maio 1881, leg. W. Mesny. A very dwarf form.

48. *Lactuca tatarica* C. A. M. — Ad lacum Ko-ko-nor, necnon circ. Ha-mi, Turkestaniæ chin., a. 1881, leg. W. Mesny.

49. *Lobelia* (*Holopogon*) *trialata*. Ham. — In prov. Sz-chuan, a. 1881, leg. E. H. Parker.

50. *Pieris* (*Portuna*) *japonica* Don.—Ad Tam-sui, ins. Formosæ, m. Maio 1882, detexit am. T. Watters. Only hitherto recorded from Japan.

51. *Ardisia pusilla* A. DC.—Juxta pagum Lung-mun, 100 m. p. a Cantone orientem versus, d. 3 Julii 1882, coll. rev. B. C. Henry. Only previously known from Japan.

52. **Symplocos** (Hopea, Lodhra) **adenopus**, sp. nov. — Frutescens, ramulis leviter angulatis fusco-pubescentibus, foliis coriaceis oblongo-lanceolatis basi acutis apice cuspidato-acuminatis margine inæqualiter rigide crebre glanduloso-serrulatis supra læte viridibus glaberrimis costa impressa venisque inconspicuis subtus pallidioribus costa venisque parce hirtellis intra marginem arcuatim anastomosantibus prominentibus $5\frac{1}{2}$–$6\frac{1}{2}$ poll. longis 20 lin. latis petiolo 7-lineali supra canaliculato glandulisque parvis ovoideis circ. 44 in series duas dispositis præditis, floribus in glomerulos densos sessiles

congestis bracteis suborbiculatis extus fusco-hirsutis intus glaberrimis circumdatis, calycis sublinealis lobis oblongis obtusis parce ciliatis, corollæ calycem duplo superantis lobis oblongis obtusis, ovario glaberrimo apice intruso, stylo integro glaberrimo calyce duplo longiore.

In jugo Lo-fau-shan, prov. Cantonensis, d. 22 Sept. 1882, leg. rev. E. Faber. (Herb. propr. n. 22138.)

Nearly allied to *S. japonica* A. DC. and *S. congesta* Benth., but quite different in foliage, and remarkable for the numerous biseriate glands along the upper surface of the petiole.

53. **Jasminum** (Unifoliata) **microcalyx,** sp. nov. — Fruticulosum, glaberrimum, leve, ramis teretibus striatis, foliis simplicibus ovatis basi cuneatis apice caudato-acuminatis mucronatis subquintupli- et penninerviis opacis nervis subtus tenuiter prominulis axillis barbatis ad $2\frac{1}{2}$ poll. longis 1–$1\frac{1}{2}$ poll. latis petiolo supra canaliculato tomentoso medio articulato bilineali, cymis axillaribus laxis 1–3 floris folio triente brevioribus, pedicellis subclavatis 2 lin. longis, calyce urceolato indurato lineam longo dentibus brevissimis triangulatis, corollæ albidæ tubo 5–7 lin. longo gracili lobis 5 acutis $2\frac{1}{2}$ lin. longis.

Juxta Hoi-hau, ins. Hai-nan, d. 19 Oct. 1882, coll. rev. B. C. Henry. (Herb. propr. n. 22171.)

Allied to *J. attenuatum* Roxb.!, *J. gracile* Vahl.!, *J. Zippelianum* Bl., &c.

54. *Fraxinus* (*Fraxinaster*) *chinensis* Roxb. — Circa pagos juxta oppidum Wu-hu, provinciæ An-hwei, m. Maio 1881, specimina foliis adultis tantum aliaque foliis juvenilibus paniculisque masculis prædita carpsit am. T. L. Bullock; exemplaria foliis adultis fructibusque maturis onusta juxta Chi-fu, prov. Shan-tung, in collinis, d. 17 Sept. 1880, leg. W. R. Carles. Roxburgh expressly states that his tree has no male, but only hermaphrodite and female flowers, but Mr. Bullock remarks—"I saw perhaps a dozen trees, but could never find female flowers or fruit." In all other respects the specimens, as also those of Mr. Carles, agree so entirely with Roxburgh's description, and with the late Mr. Hanbury's figure (Notes on Chinese Mat. Med. 41), that I do not doubt their identity. The North Chinese *F. Bungeana* DC.!, the Japanese *F. longicuspis* S. & Z.!, and the Hong Kong *F. retusa* Champ.! belong to *Ornus*, and the only East Asiatic Fraxinasters hitherto described are *F. mandshurica* Rupr. & Maxim., which has a very different fruit, and *F. rhynchophylla* Hance, which has a very much denser inflorescence, and leaves with a very long acumen. American Ashes are well distinguished, but the European and Asiatic species of both sections urgently demand serious study and examination.

55. *Osmanthus fragrans* Lour. — Ad fl. Lien-chau, prov. Cantonensis, m. Oct. 1881, coll. rev. B. C. Henry. The most southerly station known to me.

56. *Apocynum venetum* L. — Ad Ha-mi, Turkestaniæ chin., Maio 1881, leg. W. Mesny.

57. *Cynanchum* (*Endotropis*) *Bungei* Dcne. — Ad Ha-mi, Turkestaniæ chin., Maio 1881, leg. W. Mesny. Only hitherto known from N. E. China.

58. **Gentiana** (Chondrophylla) **delicata,** sp. nov. — Annua, glaberrima, caule e basi simplici, foliis infimis rosulatis 5–6 lin. longis cum ramealibus 2–4-linealibus basi connatis distantibus oblongis aristatis margine angusto hyalino minute denticulato, ramis axillaribus foliatis 1–2 floris, floribus pedicellatis, calycis semi 5-fidi lobis setaceis acuminatis corolla duplo brevioribus, corollæ infundibularis 6 lin. longæ extus viridulæ intus cæruleæ lobis erectis ovatis acuminatis plicis late ovatis minute denticulatis apiculatis lobis duplo brevioribus, stylo nullo, stigmatibus binis recurvis, capsula ellipsoidea compressa apice leviter marginata stipite æquilongo fulta mediam corollam adtingente.

Ad Wu-hu, prov. An-hwei, in montosis, alt. 2500–3000 ped., m. Maio 1881, leg. T. L. Bullock. (Herb. propr. n. 22040.)

Closely allied to *G. aquatica* L., *G. Loureirii* Griseb., *G. Piasczkii* Maxim., but well distinguished from all three.

59. *Gentiana Pneumonanthe* L. — In collibus ad Chi-fu, Chinæ bor., m. Oct. 1874, coll. F. B. Forbes; in jugo Lo-fau-shan, prov. Cantonensis, d. 22 Sept. 1882, detexit rev. E. Faber.

60. *Solanum* (*Dulcamara*) *septemlobum* Bge. — Ad Ha-mi, Turkestaniæ chin., Maio 1881, leg. W. Mesny.

61. *Lycium chinense* Mill.—Ha-mi, Turkestaniæ chin., m. Maio 1881, coll. W. Mesny.

62. *Lycium ruthenicum* Murr.—Cum præcedenti.

63. *Dodartia orientalis* L. — Circa urb. Ha-mi, raram invenit W. Mesny.

64. *Limnophila hypericifolia* Benth. — In fossis juxta Sai-ngau, ad fl. Lien-chau, prov. Cantonensis, 210 m. p. ab urbe, d. 5 Oct. 1881, leg. rev. B. C. Henry. A native of the hill-regions of India, not previously recorded from any part of China.

65. **Chirita cortusifolia,** sp. nov. — Radice fibrosa, acaulis, foliis crassiusculis e basi cordata v. truncata suborbiculatis circ. 10-lobatis lobis acutis inæqualiter grosse dentatis supra adpresse tomentosis subtus pallidis dense pustulatis nervis tomentosis $1\frac{1}{4}$–$1\frac{3}{4}$ poll. longis petiolo $1\frac{1}{2}$ pollicari fulvo-villoso, scapo ad 4 poll. longo fulvo-villoso, floribus 2–10 in umbellam simplicem v. subcompositam dispositis erectis bractea ovata 2-lineali suffultis ebracteolatis 4 lin. longis, calyce campanulato tomentoso 4 lin. longo dentibus triangulatis acutis lineam longis, corolla sursum sensim ampliata extus tomentella intus pilosula pollicem longa lobis obtusis ciliatis, staminibus 2 medio tubo insertis faucem attingentibus filamentis inferne glabris apice cum antheris dense cano-barbatis, staminodiis minimis, ovario glanduloso-piloso stylo brevi, stigmate bilobo.

In prov. Che-kiang, circa oppid. Wen-chau, inv. cl. W. G. Stronach. (Herb. propr. n. 22178.)

A small but very pretty species, which would be quite as worthy of cultivation as *C. sinensis* Lindl. I have no note of the colour of the flower. Its affinity is perhaps greatest with *C. primulacea* C. B. Clarke! (Cyrtandr. Bengal. 114, t. 82.)

(To be continued.)

NOTES ON VEGETABLE PRODUCTS OF THE SAHARANPUR & DEHRA DUN DISTRICTS, N.W. INDIA.

By J. F. Duthie, M.A., F.L.S.

(Continued from p. 181.)

Pulses.

Chana or Gram (*Cicer arietinum* L.)—The seed of this plant affords an important ingredient of horse's food in this part of India; the stalks and leaves mixed with chaff (bhusa) also constitute an excellent fodder both for cattle and horses. The seeds are eaten by the natives, either made into bread, or sweetmeats, or as dál, or parched (chabena). There are three or four varieties of gram, differing chiefly in the colour and size of the seeds, being white, brown, yellow or blackish. One kind, with large white seeds, called "Cabuli Chana," is occasionally met with, but is not much grown in this district. Gram is cultivated during the cold season; it is not often sown by itself, but usually mixed with wheat or barley, or with other kinds of pulse, such as peas and *Lathyrus sativus* (Kasári). The peculiar shape of the seed, resembling the head of a ram, explains the specific name *arietinum*. The plant is said to produce oxalic acid to such an extent as to cause pain to the feet when walking barefooted through a field of grain.

Múng (*Phaseolus Mungo* L.) is a rainy season crop, and is usually sown mixed with some kind of millet, or with cotton. This and the two following are coarse, hairy, trailing plants, and not much esteemed for human food. The seed differs in colour, being green, yellow (sona múng), or black. The stalks and leaves are much valued as cattle-fodder. The natives use it chiefly in the form of dál, and the food is sometimes given to horses when gram fails.

Urd or Mash (*P. Mungo* L., var. *radiatus*).—This is cultivated and made use of in the same manner as the preceding. There are two subvarieties, the one with black and the other with smaller green seeds. The seed of this plant is supposed to have given rise to the weight called "másha," the twelfth part of a tola.

Moth (*P. aconitifolius* Jacq.).—This possesses little value as a source of human food. The stalks and leaves are given to cattle, as well as the seeds, which are very fattening. This crop is cultivated during the rainy season on the very poorest soils, either by itself or with bájra (*Pennisetum typhoideum*).

Lobiya (*Vigna Catiang* Endl.) is another rainy season crop. It is grown in the plains, and on the hills up to about 4000 feet, hardly ever by itself, but mixed with millet or cotton. It is very variable, sometimes being met with as a short erect plant; another variety has long climbing stems; there is a good deal of difference too in the colour of the seeds, being white, brown, yellow or black. The pods are eaten as vegetables, and the seeds form an ingredient in curries. The stems and leaves are given to cattle.

Sem (*Dolichos Lablab* L.).—This is grown in the cold season, chiefly as a garden crop. It is an extensive climber, and is often

trained so as to form arbours, or to cover the doorways and roofs of houses. Roxburgh describes several varieties. The flowers are white or purple, and there is one variety with reddish purple pods (*D. purpureus* L.). The pods are eaten as a vegetable.

Masúr or Lentils (*Ervum Lens* L.).—This is not much grown in the district, being chiefly confined to low-lying damp situations. It is a cold season crop. The seeds are eaten as a dál, but are not considered wholesome; the flour, however, is said to be the chief constituent of the preparation known as *Revalenta Arabica*.

Mattar or Field Pea (*Pisum sativum* L.).—Also grown during the cold season, but to a very small extent in this district. There are two distinct kinds, the one with round white seeds, and the other with compressed marbled seeds, this latter constituting the subspecies *P. arvense* L.

Kasāri or Climbing Vetch (*Lathyrus sativus* L.).—This plant, which is cultivated during the cold season, is chiefly remarkable for its tendency to bring about paralysis of the limbs if eaten in excess. It thrives under conditions which cannot be endured by other kinds of pulse, and this accounts for its extensive cultivation on some of the village lands where the soil is suited to it. It prefers a heavy clay soil, and is not affected by inundations of water and subsequent parching of the ground.

Pigeon Pea, Tor or Arhar (*Cajanus indicus* Spreng.).—The latter name (Arhar) is that of a variety known as *C. indicus*, var. *bicolor*, and is the kind most commonly cultivated about here. It is distinguished from the typical form by having the standard streaked with red veins instead of being simply yellow. Although sown with the rainy season crops it remains in the ground throughout the cold weather, and is reaped with the crops of the latter season. There is, however, a small variety which ripens its seeds much earlier. It is sometimes sown by itself, but more generally accompanies juar bájra or cotton. It is largely grown in Dehra Dún, but in the Saharánpur district it is used chiefly as a hedge round the borders of sugar-cane fields in order to protect the young canes from the wind. The seed is considered to be wholesome, and is largely consumed in the form of dál.

Guár or Khurti (*Cyamopsis psoralioides* DC.).—This is a rainy season crop, and is much cultivated in some parts of the district for its seed, which is given to cattle; a smaller variety is also grown for the sake of its pods, which are eaten as a vegetable. The same use is also made of this plant as a wind-protector as was mentioned in the case of the pigeon pea.

(To be continued.)

NEW RECORDS FOR *RUBI* IN SOMERSET.

By Rev. R. P. Murray, M.A., F.L.S.

I wish to place on record the following species of *Rubus*, which I have met with during the present season. Many of them are new to the county; the remainder are new vice-comital records. Un-

doubtedly the greatest interest attaches to *R. saxatilis* L., which I found in May last growing freely in Asham Woods, S.W. of Frome. This station serves to connect those in Devon and Cornwall with the more northern localities of the species. The other species have been determined by Mr. T. R. Archer Briggs, to whose kindness I am much indebted, and who accompanied me in many of my excursions.

Rubus fissus Lindl.—New record for both vice-counties.
R. plicatus W. & N.—New record for both vice-counties.
R. affinis W. & N.—New record in v.-c. 5.
R. imbricatus Hort.—V.-c. 5; new to Somerset.
R. leucostachys Sm.—New to v.-c. 5.
R. calvatus Blox.—In both vice-counties, but the name occurs in a MS. list of plants observed near Cheddar, kindly lent to me by Mr. J. G. Baker.
R. adscitus Genev.—V.-c. 5; new to Somerset.
R. umbrosus Arrh.—New in v.-c. 5.
R. mucronulatus Bor.—New in v.-c. 5.
R. Borreri Bell-Salt.—V.-c. 6; new to Somerset.
R. Bloxamii Lees?—New to v.-c. 5; but some doubt attaches to the name; it is not quite the Plymouth plant.
R. Hystrix Weihe.—V.-c. 6; new to Somerset.
R. rosaceus Weihe.—V.-c. 5; new to Somerset.
R. rudis Weihe.—New to v.-c. 5.
R. Radula Weihe.—New to v.-c. 5.
R. fusco-ater Weihe.—V.-c. 5; new to Somerset.
R. diversifolius Lindl.—New to v.-c. 5.
R. Lejeunii Weihe.—V.-c. 5; new to Somerset.
R. Guntheri Weihe.—V.-c. 5; new to Somerset.
R. saxatilis L.—V.-c. 6; new to Somerset.

I hope to send fuller notes when I have had time to work out the subject more thoroughly.

SUSSEX PLANTS.

By James W. White.

The following notes were made during a recent short visit to Broadbridge Farm, situate midway between Horsham and the village of Slinfold. The soil is chiefly clay; cold and unproductive.

Malva moschata L.—Frequent in hedgerows.

Lotus tenuis Kit. — Abundant at and about the 'Stonefield' near Slinfold. The plants are large, each root producing several decumbent filiform stems about two feet in length, and very much branched and entangled. The extreme forms have quite linear leaflets, and solitary pods. *L. corniculatus* L. and *L. major* Scop. are also there in plenty, and I observed some plants intermediate in character between the former and *L. tenuis*.

Potentilla argentea L. — Some very luxuriant plants grow at

the 'Stonefield' already mentioned; two had at least a dozen stems of fifteen to twenty inches from each root. This species had been also noticed at a former visit in 1878.

Pyrus torminalis Ehrh.—There are several large trees thirty to forty feet high in hedgerows and on the outskirts of woodland on the high ground called 'Rapkins.' These trees, though not flowering at all this year, in some seasons produce abundance of fruits, which much resemble a small medlar, and are locally termed "serbs." When ripe they are gathered by the farm-labourers, and fastened on sticks after the fashion of onion-strings, but with a handle at one end; each stick having three or four pounds of fruit attached to it, and finding a market at the price of a shilling or fifteenpence.

Torilis infesta L.—Frequent in cornfields.

Galium tricorne With.—Also frequent.

Valerianella dentata Poll.—Some oat-fields were thickly sprinkled with this plant; many specimens were seen in which some of the flowers had developed a large rotate and regular calyx, the divisions often tipped with red, and giving the plant a very singular appearance.

Achillea Ptarmica L.—Sparingly in the meadows.

Euphorbia platyphylla L.—Among oats in small quantity.

Gastridium lendigerum Gaud. — I saw this among wheat in several places; one field was almost full of it, scarcely any other weed being present. I have never met with this grass as a weed of cultivation elsewhere.

Polystichum aculeatum Roth.—Typical and plentiful. The only fern noticed on the farm besides bracken.

ON THE FLORA OF SOUTH BEDFORDSHIRE.

By James Saunders.

(Concluded from p. 312).

Ceratophyllum demersum L.—Local. Luton Hoo Lake, in fruit 1882.

Parietaria diffusa Koch.—Local. Ampthill Church-yard.

Urtica dioica L.; *U. urens* L.

Humulus Lupulus L. — Abundant near Limbury, Biscot and Luton.

Ulmus montana Sm. *Quercus pedunculata* Ehrh.

Fagus sylvatica L.—Abundant over the chalk area, but often planted.

Corylus Avellana L.

Carpinus Betulus L.—Not uncommon; some fine trees on Beech Hill, near Luton, and New Mill End.

Alnus glutinosa L. *Betula alba* L.

Populus tremula L.—King's Wood, Flitwick.

P. alba L.—Rare. Near Shillington.

P. canescens Sm.—Rare. Near Caddington.

Salix fragilis L.; *S. viminalis* L.
S. purpurea L.—Local. Limbury, Biscot.
S. triandra L.—Local. New Mill End.
S. cinerea L.; *S. Caprea* L.; *S. alba* L.
Typha latifolia L.
Sparganium ramosum Huds.; *S. simplex* Huds.
Arum maculatum L.
Lemna trisulca L.—Local. Limbury Ponds.
L. minor L.; *L. gibba* L.—Local. Luton Hoo.
L. polyrhiza L.—Rare. Luton Hoo.
**Potamogeton natans* L.—Common.
P. perfoliatus L.—Local. Limbury Ponds.
P. crispus L.; *P. densus* L.—Common.
P. pusillus L.—Local. New Mill End.
P. pectinatus L.—Luton Hoo Lake.
P. lucens L., var. *acuminatus*.—Occurs in the River Ouse, near Bedford.

Zannichellia brachystemon Gay.—Local. The sources of the Lea, Biscot, Luton Hoo Lake.

Triglochin palustre L.
Sagittaria sagittifolia L.—Local. River Ousel, Leighton.
Alisma Plantago L., b. *lanceolatum*.—Flitwick Marsh.
Butomus umbellatus L.—Rare, by the River Lea, New Mill End.
Elodea canadensis Mich.
Orchis pyramidalis L.—Abundant on the chalk hills.
O. ustulata L. — Rare; apparently limited to the lower chalk escarpment.

O. Morio L. — Locally abundant in meadows on clay soil. Pepperstock, Farley, Caddington. At the last-named station the flowers vary from a dark purple to a cream-white.

O. mascula L.; *O. latifolia* L.; *O. maculata* L.
Gymnadenia conopsea Brown.—Abundant on the chalk hills.
Habenaria viridis Brown.—Locally abundant in moist meadows. Pepperstock, Farley, Sundon.
H. chlorantha Bab.—Abundant in moist woods.
Ophrys apifera Huds.—Erratic on the lower chalk escarpment. Barton, 1879; Streatley, 1881; Sharpenhoe, 1882. Carefully searched for in 1880, but could nowhere be found.
O. muscifera Huds. — Rare, on the chalk escarpment, but constant in appearance. Streatley and Sundon Hills.
Spiranthes autumnalis Rich.—Limited to the chalk escarpment; uncertain in appearance. Plentiful in 1879–80 on Pegsdon and Barton Hills; absent both in 1881 and 1882; in blossom, 1883.
Listera ovata Brown.
Neottia Nidus-avis Rich. — Uncertain. Daffodil Wood, 1877 Sundon Wood, Dumb Hill's Wood, 1878.
Epipactis latifolia Auct.
Cephalanthera grandiflora Bab.—Rare. Under beech trees by the New Mill End Road, Markham Hills.

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* The Potamogetons have been examined by Mr. Arthur Bennett, to whom the writer's best thanks are due.

Iris fœtidissima L.—Local. Houghton Regis, Flitwick West.
I. Pseudacorus L.—Locally abundant.
Narcissus Pseudo-narcissus L. — Local. Very abundant in Daffodil Wood.
Tamus communis L.
Paris quadrifolia L. — Abundant in copses both on chalk and clay soils. Not observed on the arenaceous strata.
Polygonatum multiflorum All. — On an island in the Luton Hoo Lake. Possibly planted.
Convallaria majalis L. — Limited to woods on the lower greensand. Abundant in Aspley and King's Wood.
(*Smilacina bifolia* Desf. — Reported many years ago from "Aspley Woods, under fir trees." Was carefully searched for both last year and this, but unsuccessfully.)
Ornithogalum umbellatum L. — Occurs plentifully in meadows south of Luton, and near Limbury, but probably only as a garden escape.
Scilla nutans Sm.
Allium ursinum L.—Local. Dumb Hill's Wood, East Hyde.
Luzula pilosa Willd.; *L. sylvatica* Bich. (local, Aspley); *L. campestris* DC.
L. multiflora Koch, b. *congesta*.—Local. King's Wood, Flitwick Marsh.
Juncus conglomeratus L.; *J. effusus* L.; *J. glaucus* Sibth.; *J. acutiflorus* Ehrh.; *J. lamprocarpus* Ehrh.; *J. supinus* Mœnch. (Flitwick Marsh); *J. bufonius* L.; *J. squarrosus* L. (rare, Aspley).
J. obtusiflorus Ehrh.—Local. Harlington Brick-fields.
Scirpus palustris L.; *S. lacustris* L.
S. multicaulis Sm.—Woodside, Pepperstock.
S. setaceus L.—Local. Totternhoe, Biscot.
S. sylvaticus L.—Very local. Abundant on Flitwick Marsh.
Eriophorum angustifolium Roth.
Carex pulicaris L.—Rare. Eversholt, Mr. McLaren.
C. disticha Huds.—Luton Hoo, Biscot, Flitwick.
C. paniculata L.; *C. vulpina* L.
C. muricata L.—Limbury.
C. stellulata Good.—Local in bogs. Flitwick, Heath and Reach.
C. remota L.; *C. vulgaris* Fries; *C. glauca* Scop.
C. curta Good.—Local. Flitwick Marsh. Heath and Reach.
C. ovalis Good.—Pepperstock, Flitwick.
C. stricta Good.—Rare. By a rill, Markham Hills.
C. pilulifera L.—Local. Heath and Reach, King's Wood.
C. præcox Jacq.; *C. sylvatica* Huds.; *C. fulva* Good.
C. pallescens L.—Local. King's Wood. *C. pendula* Huds.—Local. Southill Park.
C. flava L.—Rare. Bog, Heath and Reach.
C. hirta L.; *C. paludosa* Good.; *C. riparia* Curtis; *C. ampullacea* Good.
Anthoxanthum odoratum L. *Digraphis arundinacea* Trin.
**Phalaris canariensis* L.—Is frequent as a casual at the Deodorizing Works, Luton.

Alopecurus agrestis L.; *A. geniculatus* L.; *A. pratensis* L.
Phleum pratense L. *Phragmites communis* Trin.
Agrostis Spica-venti L.—Rare. In a field at Streatley.
A. canina L.; *A. alba* L.; *A. vulgaris* With.
Calamagrostis Epigeios Roth. — Rare. In the damp parts of King's Wood, near Leighton.
Milium effusum L. *Aira cæspitosa* L.
A. caryophyllea L., *A. flexuosa* L., and *A. præcox* L. are locally abundant on sandy soil. Aspley, Flitwick, Pepperstock.
Avena flavescens L.; *A. pubescens* L.; *A. pratensis* L.; *A. fatua* L.; *A. elatior* L.
Holcus mollis L.; *H. lanatus* L.
Triodia decumbens Beauv. — Very local. Abundant on Flitwick Moor, Pepperstock.
Koeleria cristata Pers.—Abundant on chalk-hills.
Molinia cærulea Mœnch.—Local. Flitwick Marsh, Aspley Wood.
Melica uniflora Retz. *Catabrosa aquatica* Beauv. *Glyceria fluitans* Brown; *G. aquatica* Sm.
Sclerochloa rigida Link.—Frequent on old walls.
Poa annua L.; *P. pratensis* L.; *P. trivialis* L.
P. nemoralis L.—Local. Luton Hoo.
P. compressa L.—Local. Pepperstock, Streatley.
Briza media L. *Cynosurus cristatus* L. *Dactylis glomerata* L.
Festuca Myurus L. prop. — Locally abundant. Aspley Heath and Reach.
F. sciuroides Roth.—Local. Aspley Heath, Pepperstock.
F. ovina L.; *F. duriuscula* L.; *F. elatior* L.; *F. pratensis* Huds.
Brachypodium sylvaticum R. & S.
Bromus giganteus L.—Local. Totternhoe, Biscot.
B. asper Murr.; *B. mollis* L.; *B. sterilis* L.
B. secalinus L.—Rare. Streatley.
B. commutatus Schrad.—Local. Totternhoe, Barton.
**B. arvensis* L., & var. *multiflorus*.—Not uncommon near Luton.
T. caninum Huds.; *T. repens* L.
Lolium perenne L., var. *tenue* L.—Biscot.
L. italicum Braun.—Is too abundant in waste places and hedge-rows to be omitted. It is thoroughly established in the south of the county, and in N. Herts.
Hordeum pratense Huds.—Local. Near Luton, Sundon, Streatley.
H. murinum L.
Nardus stricta L.—Very local. Flitwick Moor, Mr. McLaren.
Pteris aquilina L.
Lomaria Spicant Desv.—Local. Luton Hoo, Flitwick, Aspley.
Asplenium Adiantum-nigrum L.
Scolopendrium vulgare Sm.—Rare. By a rivulet, Toddington.
Aspidium aculeatum Sw.—Local. Flitwick, Brammingham.
Nephrodium Filix-mas Rich.
N. spinulosum Desv.—Local. Aspley Woods.
Polypodium vulgare L.
(*Osmunda regalis* L. — Recorded by Abbot for Aspley Woods. The writer has searched many times for it unsuccessfully, and

found it in Little Brickhill Woods, Bucks, near the county border, in July, 1883. An old man, whose habits have rendered him familiar with the woodlands of this district from his youth up, says, "There is not a plant left on his Grace's estate." It is probably extinct in Beds.)

Ophioglossum vulgatum L. — Local. Sundon, Bedwell, Caddington.

Equisetum arvense L.; *E. palustre* L.; *E. limosum* L.

E. fluviatile L.—Chorlton.

E. maximum L.—Rare. Barton Springs.

Chara fragilis Desv.—Not uncommon. Ponds, Limbury, Brammingham, Totternhoe, and near Sheep's Lane. Var. *Hedwigii*.—Limbury.

C. hispida L.—Rather rare. Totternhoe, Limbury.

C. vulgaris L. (*C. fœtida* Braun.).—Not uncommon. River Lea, Biscot, and Luton; ponds and ditches, Brammingham, Totternhoe, Ridgmount, and near Sheep's Lane. Var. *longibracteata* Kütz. —River Lea, north of Luton.

Tolypella intricata Leonh. — Very rare. In a small pool, Brammingham. First observed March 4th, 1883. In company with Mr. H. Groves, it was gathered in fine fruit in May, 1883.

Nitella mucronata Kütz. — Rare and uncertain. In a water-hole close by the River Ouse, near Bedford, C. H. Davies and J. S., Oct., 1882. Not observed in the south of the county. Absent from this station in 1883.

N. opaca Ag. — Occurs plentifully in ponds at Brammingham and Sundon, and in the sources of the River Lea at Biscot.*

A SYNOPSIS OF THE GENUS *SELAGINELLA*.

By J. G. Baker, F.R.S.

(Continued from p. 244).

84. **S. polycephala,** n. sp.—Stems trailing, a foot long, flat on the back, bisulcate on the face, copiously pinnate, the branches ascending and copiously compound. Leaves of the lower plane close on the branches, ascending, oblique ovate, acute, 1-12th to 1-8th in. long, pale green, moderately firm in texture, more produced on the upper side of the midrib, rounded and ciliated on the upper side at the base, and a little imbricated over the branch; leaves of the upper plane half as long, oblique ovate, acute, not cuspidate. Spikes copious, square, $\frac{1}{2}$–1 in. long, $\frac{3}{4}$ lin. diam.; bracts ovate, acute, much imbricated, strongly keeled.

Hab. Mountains of Ocana, New Granada, at 5000–6000 feet, *Schlim* 493! *Holton* 82! A near ally of *S. substipitata.*

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* The *Characeæ* have been named by Messrs. H. & J. Groves, whose valuable aid is gratefully acknowledged.

85. S. SUBSTIPITATA Spring Mon. ii. 198; *S. straminea* Spring.—Stems trailing, reaching a foot in length, terete on the back, angled on the face, forked low down and copiously pinnate, with short erecto-patent copiously compound branches. Leaves of the lower plane touching on the branchlets, spaced on the main stem, ascending, oblique ovate, acute, 1-12th to 1-8th in. long, pale green, moderately firm in texture, more produced on the upper side of the midrib, shortly rigidly ciliated and very cordate at its base, much imbricated over the stem; leaves of the upper plane half as long, ovate, with a very long cusp. Spikes copious, $\frac{1}{6}$–$\frac{1}{4}$ in. long, $\frac{1}{2}$ lin. diam., square; bracts ovate-cuspidate, strongly keeled.

Hab. West Indies. Guadeloupe, *L'Herminier*! *Husnot* 576! Porto-Rico, *Schwanecke*! Dominica, *Imray*! Martinique, *Belanger* 381.

86. **S. schizobasis**, n. sp.—Stems trailing, a foot long, flat on the back, bisulcate on the face, copiously pinnate, with short erecto-patent copiously compound rhomboid branches. Leaves of the lower plane ascending, close on the branchlets, much spaced on the main stem, oblong, obtuse, 1–12th to 1–8th in. long, pale green and thin in texture, nearly equilateral, attached to the side of the stem, the base on the upper side not at all imbricated over it and not ciliated; leaves of the upper plane a third as long, oblique oblong, with a minute cusp. Spikes $\frac{1}{4}$–$\frac{1}{2}$ in. long, $\frac{1}{2}$ lin. diam., square; bracts ovate, acute, strongly keeled.

Hab. Mexico, in the province of Chiapas, *Dr. Ghiesbreght*, 605! A near ally of the Himalayan *S. semicordata*.

Group. III.—STOLONIFERÆ.

87. S. FAUCIUM Liebm.; Fourn. Fil. Mex. 148.—Stems quite trailing, a foot long, angled on the back, bisulcate on the face, copiously pinnate, with short copiously compound erecto-patent branches. Leaves of the lower plane ascending, close or slightly spaced, ovate-oblong, obtuse, 1-12th to 1-8th in. long, bright green and moderately firm in texture, minutely petioled, much more produced on the upper side of the midrib, not ciliated, cordate at the base and imbricated over the stem; leaves of the upper plane one half as long, ovate, with a cusp as long as the lamina. Spikes $\frac{1}{4}$–$\frac{1}{2}$ in. long, $\frac{3}{4}$ lin. diam., square; bracts ovate-lanceolate, very crowded, strongly keeled.

Hab. Mexico, at Huitamalea and Hacienda de Jova, *Liebmann*!

88. **S. nicaraguensis**, n. sp. — Stems trailing, above a foot long, with a long whip-like end, flat on the back, bisulcate on the face, copiously pinnate, with short copiously compound ascending lower branches. Leaves of the lower plane ascending, contiguous on the branchlets, spaced on the main stem, oblong-lanceolate, subacute, 1-12th to 1-8th in. long, pale green, thin in texture, nearly equilateral, laterally attached and truncate at the base, not at all imbricated over the stem; leaves of the upper plane one-third as long, ovate, acute, not cuspidate. Spikes $\frac{1}{4}$–$\frac{1}{2}$ in. long, $\frac{1}{2}$ lin. diam., square; bracts ovate, acute, crowded, strongly keeled.

Hab. Guatemala, in forests of Grenada, *Levy* 360! A near ally of *schizobasis* and *semicordata*.

89. **S. Fendleri,** n. sp. — Stems trailing, about a foot long, terete on the back, bisulcate on the face, the root-fibres not extending to the upper nodes, copiously pinnate, the short erecto-patent branches with several short pinnately arranged branchlets. Leaves of the lower plane oblique ovate, acute, $\frac{1}{8}$–$\frac{1}{6}$ in. long, close on the branches, much spaced on the main stem, spreading or rather ascending, pale green, moderately firm in texture, much more produced on the upper side of the midrib, where it is rather cordate at the base, strongly ciliated and a little imbricated over the branch; leaves of the upper plane one-third as long, oblique ovate, with a short cusp. Spikes copious, square, $\frac{1}{4}$–$\frac{1}{2}$ in. long, $\frac{1}{2}$ lin. diam.; bracts crowded, ovate cuspidate, strongly keeled.

Hab. Panama, at Chagres, *Fendler* 382!

90. **S. subsegregata,** n. sp. — Stems trailing, 6–9 in. long, nearly flat on both faces, the root fibres not ascending to the upper nodes, copiously pinnate, the branches erecto-patent, the general outline pyramidal, the lower branches elongated and copiously compound. Leaves of the lower plane spaced, except towards the top of the branchlets, oblique ovate, acute, 1-12th to 1-8th in. long, bright green and moderately firm in texture, much more produced on the upper side of the distinct midrib, the upper edge shortly ciliated towards the base, which is very cordate and much imbricated over the branch; leaves of the upper plane one-half as long, oblique ovate, with a long cusp. Spikes $\frac{1}{4}$–$\frac{1}{2}$ in. long, 1 lin. diam., not sharply square; bracts ovate cuspidate, strongly keeled.

Hab. Rio Janeiro, *Glaziou* 4501! A near ally of *S. substipitata*.

91. **S. caudorhiza,** n. sp. — Stems trailing, above a foot long, lengthened out and whip-like at the tip, deeply sulcate on the face, flat on the back, copiously pinnately branched, the branches erecto-patent, the upper ones short, the lower elongated and copiously compound. Leaves of the lower plane oblong-lanceolate or lanceolate, acute, 1-12th to 1-8th in. long, close on the branches, ascending, nearly equal on both sides of the distinct midrib, truncate at the base, not at all imbricated over the stem, shortly ciliated through the lower half of the upper edge; leaves of the upper plane one-third as long, oblique ovate, shortly cuspidate, much imbricated. Spikes copious, $\frac{1}{6}$–$\frac{1}{4}$ in. long, square, $\frac{1}{2}$ lin. diam., often as if lateral; bracts ovate-lanceolate, strongly keeled.

Hab. Surinam, *Hostmann* 3! Allied to *faucium* and *semicordata*.

92. S. LONGISSIMA Baker in Trimen Journ. 1881, 208. — Stems trailing to a length of 2 ft. or more, the deltoid branches 6–9 in. long, with ascending simple upper and slightly compound lower branchlets, the ultimate divisions 2–2½ in. long. Leaves of the lower plane close, obliquely attached, ovate-oblong, acute, $\frac{1}{8}$ in. long, the two sides not very unequal, the upper strongly ciliated at the base; leaves of the upper plane one-third as long, oblique ovate, nearly erect, obscurely cuspidate. Spikes terminal on the branchlets, square, 1–2 in. long, 1 lin. diam.; bracts ovate-lanceolate, erecto-patent, strongly keeled.

Hab. New Granada; Antioquia, 3000 feet, in forests, *Kalbreyer* 1815!

93. S. METTENII A. Br. Ind. Sem. Hort. Berol. 1867, App. 1; 1871, App. 9.—Stems slender, wide-trailing, distantly pinnate, the short branches flabellately compound. Leaves of the lower plane nearly contiguous on the branchlets, the upper ascending, the lower spreading, oblong, obtuse, $\frac{1}{8}$ in. long, bright green, moderately firm in texture, nearly equal-sided, rounded on both sides at the base, not ciliated, not at all imbricated over the stem; leaves of the upper plane one-third as long, oblique ovate, acute, not cuspidate. Spikes square, $\frac{1}{2}$ lin. diam.; bracts ovate-deltoid, gradually narrowed to the point, subentire.

Hab. Originally noticed in the Botanic Garden at Leipsic about 1865. Supposed to be a hybrid between *uncinata* and *inæqualifolia*.

94. S. EXCURRENS Spring Mon. ii. 214. — Stems trailing, very slender but firm, densely matted, jointed at the nodes, angled on both faces, excurrent and whip-like at the end, copiously pinnate, the short branches copiously compound. Leaves of the lower plane close on the branches, spreading, oblong-lanceolate, subobtuse, $\frac{1}{2}$ lin. long, bright green, firm in texture, more produced on the upper side of the midrib, obscurely ciliated, rounded on both sides at the base, laterally attached, not imbricated over the stem; leaves of the upper plane one-half as long, oblong, acute, much imbricated. Spikes not seen.

Hab. Central and South Brazil, and Banda Oriental, *Fox* 125! *Tweedie* 573! Well-marked in the group by its small close leaves of firm texture.

95. **S. intacta,** n. sp. — Stems slender, trailing, intermatted, jointed at the nodes, about a span long, acutely angled on back and face, copiously pinnate and irregularly forked, the branches distantly compound. Leaves of the lower plane spaced even on the branchlets, ascending, ovate- or oblong-lanceolate, acute, about $\frac{1}{2}$ lin. long, rigid in texture, not ciliated, more produced on the upper side of the midrib, rounded at its base, clasping the stem obliquely; leaves of the upper plane one-half as long, oblique oblong, acute, imbricated. Spikes $\frac{1}{4}$–$\frac{1}{2}$ in. long, square, $\frac{1}{2}$ lin. diam.; bracts ovate, acute, crowded, strongly keeled.

Hab. Andes of Ecuador, in woods of the temperate region at St. Nicolas, *Sodiro*! A well-marked species.

96. S. DISTORTA Spring Monog. ii. 212.—Stems slender, trailing or suberect, intermatted, 3–6 in. long, obscurely jointed at the nodes, subterete, copiously pinnate, the short ascending branches subflabellately compound. Leaves of the lower plane crowded on the branchlets, deflexed, oblong-lanceolate, acute, about $\frac{1}{2}$ lin. long, firm and rather rigid in texture, more produced on the upper side of the midrib, at the rounded base of which they are shortly ciliated, but not imbricated over the stem; leaves of the upper plane more than half as long, imbricated, oblong, acute. Spikes short, square, $\frac{1}{2}$ lin. diam.; bracts ovate, acute, strongly keeled. Var. *major* Baker.—More luxuriant, with stouter stems reaching a foot or more in length and often excurrent at the end, leaves of lower plane often 1-12th in. long, spreading or rather ascending.

Hab. Mountains of Central and Southern Brazil. Var. *major* (*Burchell* 6803! 8724! *Glaziou* 7355!) connects the type with *S. marginata*.

97. S. STOLONIFERA Spring Mon. ii. 209; *Lycopodium stoloniferum* Sw.; *L. Pœppigianum* Hook & Grev., ex parte. — Stems trailing, reaching a length of a foot or more, often excurrent and whip-like at the end, jointed at the nodes, angled on the back and face, copiously pinnate, with short copiously compound branches. Leaves of the lower plane close on the branchlets, rather ascending, oblong-lanceolate, acute, 1-12th to 1-8th in. long, rather rigid in texture, nearly equal-sided, laterally inserted, not imbricated over the back of the stem, shortly ciliated and more rounded on the upper side at the base, minutely auricled on the lower. Spikes $\frac{1}{4}$—$\frac{1}{2}$ in. long, square, $\frac{1}{2}$ lin. diam.; bracts ovate, acute, strongly keeled.

Hab. West Indies: Cuba, Jamaica, San Domingo, Dominica, &c.

(To be continued.)

NOTES ON SOME PLANTS OF NORTH-EAST CORNWALL.

By T. R. Archer Briggs, F.L.S.

Last year I contributed some notes on the botany of the portion of Cornwall lying between the town of Bodmin and its north coast by Portquin and Port Isaac Bays, forming part of the basin of the Camel or Allan River (Journ. Bot. 1882, pp. 231–238). In the June of this year I was enabled to carry on a further investigation of the same tract whilst on a visit at Lavethan, in the parish of Blisland, from the 18th to the 23rd of that month. The following notes are the result of observations made during those six days:—

Ranunculus hirsutus Curt.—St. Minver, and between this village and St. Kew. Stations are named in my former paper, and the plant is one of the characteristic species of the tract, though yet more frequent in some parts of Cornwall further west.

Chelidonium majus L.—St. Tudy; together with *Smyrnium* and *Humulus Lupulus*; the three doubtless originally introduced.

Fumaria confusa Jord.—Near Bodmin; St. Minver.

Sinapis nigra L.—St. Minver.

Brassica Rapa L., c. *Briggsii* Lond. Cat., ed. 7.—By roadsides and in waste spots; and sometimes in tillage fields a most abundant weed. In waste ground at Tregenna Hamlet, and among potatoes between it and Blisland Village. Pendrief, rendering two plots of corn yellow, to the exclusion, in at least one, of *Sinapis arvensis* also with corn and among potatoes in abundance between Blisland Village and Trewardale. In a corn-field between St. Teath Mill and St. Tudy, uniting with *Sinapis arvensis* to make the field look more yellow than green. As a roadside weed near St. Teath Village, and near Poleys Bridge, between St. Tudy and Blisland Villages, June, 1883. Doubtless it was this plant that the Rev.

J. Pike Jones and Mr. Anderson noticed long ago in a more western part of the county, and of which we find the former writing as follows in his 'Botanical Tour in Devon and Cornwall' (p. 35):—"In the corn-fields about Zennar and St. Ives we discovered a species of *Brassica* which answers in almost every respect to *Brassica campestris*. I have observed the same plant about Moreton and North Bovey, in Devonshire. This plant being, however, extremely rare in England, I expressed some doubts to Mr. Anderson on the subject. In answer to my letter he says, 'My specimens are not quite competent to ascertain decidedly this rare species. I intend to cultivate it.' His sudden death prevented my hearing again from him on the subject. I hope some future botanist will determine the point." The cultivated rape has larger and fewer flowers than this *Brassica*, and its open ones are more racemosely arranged.

Barbarea vulgaris Br.—Helland Bridge; St. Teath; Amble; St. Minver.

Cochlearia danica L.—Between St. Minver and St. Kew.

Reseda Luteola L.—Near Amble; St. Minver, and between that and St. Kew.

Silene anglica L.—By Camelford Road, near Key Bridge.

Lychnis diurna Sibth.—A plant with white flowers by the Blisland and Camelford Road, at Michaelstow, growing close to one with them of the ordinary colour; another between Highway and St. Tudy; and a third between St. Kew and St. Minver.

Stellaria media With., d. *umbrosa*.—Bank near Poleys Bridge. Not quite typical for this variety through having the peduncles slightly hairy.

Sagina subulata Wimm.—On the common by the Jubilee Rock, Blisland; Bodmin Down.

Tamarix anglica Webb.—In two places in hedges near St. Minver Village; a station given for it in Mr. Keys's 'Flora of Devon and Cornwall,' on the authority of Mr. F. P. Balkwill. Here it has all the appearance of being simply a planted hedgerow shrub; in one of the spots having the common lilac in a hedge opposite to it.

Hypericum Androsæmum L.—Between St. Teath Mill and St. Tudy; Lavethan.

H. dubium Leers.—In one place on a hedge-bank near St. Teath Village.

Geranium Robertianum L., β. *purpureum* Bab. Man., ed. 8, p. 74. —In plenty for a distance of over a quarter of a mile from St. Minver Village to the cross-road to Wadebridge from the St. Minver and the St. Kew Road. Here and there growing with the type, but hardly passing into it, though occurring with flowers varying considerably in size in individual plants. I have referred this variety of *G. Robertianum* to the *purpureum* of Babington rather than to that of Lond. Cat., as I feel somewhat doubtful whether it belongs to the *modestum* or to the *purpureum* of E. B., ed. 3, and so of Lond. Cat., ed. 7. The sepals are hairy, and some of the hairs are gland-tipped. The plant is rather more hairy than

specimens of a very similar plant from the neighbourhood of Torquay. I have found this latter come true from seed. Although Dr. Boswell describes his var. *purpureum* as being glabrous, "except a few short glandular hairs on the sepals, and in a strip on the peduncles and pedicels," the plant, as figured in E. B., ed. 3, with the reference E. B. S., 2648, has the leaves represented as somewhat hairy generally.

Rhamnus Frangula L.—Left bank of the Camel between Tresarret and Dunmeer Bridges.

Acer campestre L.—A few bushes in one place in a hedgerow between St. Teath Mill and St. Tudy Village.

Trifolium medium L.—Between Michaelstow and Camelford; near St. Teath.

T. hybridum L.—By the side of a road between Amble and St. Minver.

T. filiforme L.—Tregenna, Blisland; Bodmin Down; Michaelstow.

Vicia tetrasperma Mœnch.—Towards Bodmin from Dunmeer.

Prunus insititia L.—Between Amble and St. Minver. The shrub presumed to be identical with *P. fruticans* Weihe, and an undoubtedly indigenous one in Devon and Cornwall, seemingly generally diffused throughout the counties.

P. Cerasus L.—Between Wineford and Camelford; between St. Kew and the Wadebridge and Camelford Road; between St. Teath and St. Tudy. This is so frequent in hedgerows in Devon and Cornwall, and occurs under such conditions, as to quite entitle it to a place in the denizen list.

Agrimonia odorata Mill.—A plant noticed by the tramway in the Camel Valley near Poleys Bridge.

Alchemilla vulgaris L.—In a waste spot by the Bodmin and Launceston Road, just before you enter on Bodmin Down. This station is possibly just beyond the Camel River basin and within that of the Fowey; but, as the plant appears to be extremely scarce in E. Cornwall, it is desirable to put its occurrence at the place on record.

Potentilla procumbens Sibth.—Quite common. Bodmin; St. Tudy; St. Kew; St. Teath. Between Blisland and Camelford.

Rubus rhamnifolius W. & N.—Near Blisland, by the road to Camelford. The Bramble of the *Rhamnifolii* group mentioned in the 'Flora of Plymouth' under *R. Lindleianus* as "allied to *Lindleianus*" is one of the commonest Rubi in the Camel basin, as it seems to be throughout Devon and Cornwall. I may here mention that I have recently detected it at several spots in the county of Somerset.

R. leucostachys Sm.—Between Wineford and Camelford; St. Teath.

R. umbrosus Arrh.—Michaelstow. Between Camelford and Helstone.

R. Radula Weihe.—Bodmin; Dunmeer.

R. diversifolius Lindl.—Between Blisland and Camelford; St. Teath.

R. pyramidalis Bab.—By the tramway in the Camel Valley near Helland.

R. corylifolius Sm.—Between Amble and St. Minver.

Rosa tomentosa Sm.—Between Blisland and Camelford; St. Teath; between Highway and St. Tudy; between Amble and St. Minver.

R. micrantha Sm.—Between Blisland and Camelford. Between St. Kew and the Wadebridge and Camelford Road; in one place with white flowers; also in this locality another slight variety with leaves somewhat glaucous above, which is very unusual in *R. micrantha*. Between Amble and St. Minver. Quite a common species in Cornwall. Judging from its plentiful occurrence, and the rarity of *R. rubiginosa*, with which it was formerly confused, there is little doubt that this is the species the historian of the county, Dr. Borlase, had in view in the following extract:—"It is suggested that the sweet-brier, or eglantine, does not grow naturally in Cornwall; but this is a great mistake, as, from experience, I can aver having plucked this perfumed plant out of the hedges in the neighbourhood of Mount's Bay, and transplanted them into my own garden, where they flower in as great perfection as anywhere, and may be easily multiplied by seeds, slips, or cuttings."—Nat. Hist. Corn., 224, 1758. At the present day *R. micrantha* is to be met with in cottage gardens in the county, as well as *R. rubiginosa*.

R. canina L.—a. *lutetiana*, between Wineford and Camelford. e. *dumalis*, between Denhams Bridge and St. Endellion; St. Kew; between Amble and St. Minver. g. *urbica*, between Denhams Bridge and St. Endellion. j. *dumetorum*, in a hedge as you descend to Poleys Bridge from St. Tudy. n. *andevagensis*, a fine robust glaucous-leaved form in a hedge just after you pass out of Chapel Amble towards St. Minver; also this variety in one or two other spots near St. Minver.

R. leucochroa Desv.—Between Amble and St. Minver.

Mespilus germanica L.—For about eight yards in a hedge between St. Mabyn Village and Denhams Bridge, a spot intermediate between two of the stations that I previously recorded (Journ. Bot. 1882, 234); for about ten yards in a hedgerow between St. Tudy Village and St. Teath Mill, two or three miles from the other stations.

Cratægus Oxyacantha L., b. *monogyna*.—Two or three bushes of a slight variety with remarkably large leaves by the Camelford Road, near Michaelstow.

Pyrus torminalis Ehrh.—Further observations confirm the opinion as to this being a rather common species in the tract. The following are additional stations:—Hedge between St. Mabyn and Denhams Bridge; in two spots between St. Kew and the Wadebridge and Camelford Road, and in one between St. Kew and St. Minver; also between St. Tudy and St. Teath Mill.

P. communis L.—Two very small bushes on a hedge-bank between St. Kew and St. Minver. In a hedge by Bodmin Down a large bush grows a little below the Bodmin and Launceston Road,

but the spot is just beyond the basin of Camel River and within that of the Fowey.

P. Aucuparia Gaertn.—Between St. Teath and St. Tudy; near Michaelstow Beacon. Whilst *P. torminalis* increases in frequency in the warmer portions of country, *P. Aucuparia* becomes commoner in the colder and elevated ones.

P. Malus L., a. *acerba*.—Between St. Tudy and St. Teath Mill. This is an unquestionably indigenous shrub in Cornwall and Devon.

Peplis Portula L.—On the down by Jubilee Rock, Blisland.

Epilobium lanceolatum S. & M.—About two dozen plants on the tramway between Tresarret and Helland Bridges; also a single plant near Dunmeer.

E. obscurum Schreb.—Blisland Village, &c.

Callitriche obtusangula Le Gal.—In two ponds at Amble, near but additional to the spots in this locality whence I previously recorded it.

C. stagnalis Scop.—Between St. Minver and St. Kew; between St. Tudy and St. Teath.

C. pedunculata DC.—In a damp muddy spot by the roadside between Michaelstow and Camelford.

Ribes rubrum L.—A bush in a wood in the Camel Valley between Tresarret and Helland Bridges.

Petroselinum sativum Hoffm.—Common on hedge-banks about St. Minver Village. More diffused than I remember to have seen it in any other place.

P. segetum Koch.—St. Minver.

Ægopodium Podagraria L.—By Lavethan Mill, Blisland; with *Humulus Lupulus*.

Heracleum Sphondylium L.—The variety of this with narrow leaflets occurs at St. Teath.

Chærophyllum Anthriscus Lam.—In one spot near St. Minver Village, with the *Geranium purpureum*. *C. temulum* is the common Umbellifer of the tract, as would likewise be the case in many other parts of Cornwall and in Devon.

Conium maculatum L.—St. Minver.

Smyrnium Olusatrum L.—Tregenna Hamlet, Blisland; St. Tudy; St. Minver, and between this village and St. Kew.

Galium verum L.—St. Minver. The somewhat local distribution of this species in Cornwall and Devon makes it desirable to note stations for it. As this peculiarity applies in a measure to *Galium Mollugo* L. also, it is worth while to add that it abounds in the Camel Basin, as about Plymouth.

Dipsacus sylvestris L.—Bodmin.

Carduus tenuiflorus Curt.—St. Minver.

Tanacetum vulgare L.—St. Teath.

Anthemis nobilis L,—Near Michaelstow Beacon; between Highway and St. Tudy.

Achillea Ptarmica L.—Near Michaelstow Beacon: not noticed elsewhere in the tract. An abundant plant on some of the very barren cold clayey lands in Devon and Cornwall, whilst in certain other parts sparse, or perhaps rare.

Bidens tripartita L.—Damp waste spot near Amble, St. Kew.

Inula Conyza DC.—Between Highway and St. Tudy; St. Minver. A species partial to dry soils and warm situations.

Petasites fragrans Presl.—Bodmin; of course as "an escape" or garden-outcast. St. Teath; by a roadside with *Armoracia rusticana*.

Leontodon hispidus L.—In the lawn at Lavethan. A local plant in Cornwall and Devon.

Helminthia echioides Gaertn.—St. Minver.

Hieracium umbellatum L.—Near Trewardale; by the road from Blisland to Camelford, near Key Bridge.

Menyanthes trifoliata L. — Bog near Wringford, on the right of the road from St. Tudy to Poleys Bridge; with *Pedicularis palustris*, *Anagallis tenella*, *Potamogeton polygonifolius*, *Eriophorum angustifolium*, *Carex pulicaris*, *C. panicea*, and some other marsh and bog species.

Convolvulus arvensis L.—On a bank at Amble a very beautiful variety having flowers of a bright rose-colour, and well worthy of cultivation.

Sibthorpia europæa L.—Pendrief, Blisland, in plenty on and about the damp banks and walls of a lane.

Veronica montana L.—Between Tresarret and Dunmeer Bridges.

Lycopus europæus L. — In the vale close to St. Teath Mill; Amble.

Mentha piperita Huds.—By a pond at Amble, close to a road leading to a farm-house.

Salvia Verbenaca L.—In one spot between St. Minver and St. Kew; in another between Highway and St. Tudy.

Melittis Melissophyllum L.—Between St. Mabyn and Denhams Bridge. In or about the Camel Valley between Tresarret and Dunmeer Bridges, but seen only rather sparingly.

Ballota nigra L.—St. Minver, and between it and St. Kew.

Lamium album L.—Bodmin; Dunmeer; Helstone, near Camelford. In the south-west of England this is rarely seen away from villages or houses; a peculiarity maintained in the tract to which these notes have reference.

Myosotis repens Don.—Between Blisland and Camelford.

Anchusa sempervirens L.—Near Michaelstow; St. Minver.

Symphytum officinale L.—In one place between Tresarret and Helland Bridges. Quite an uncommon plant over some portions of Devon and Cornwall, and for the most part appearing as a probable "escape" from former cultivation.

Plantago maritima L.—In bare elevated spots by the road between Wineford and Camelford.

Littorella lacustris L.—In pools on the down by the Jubilee Rock, Blisland.

Parietaria diffusa Koch.—St. Teath.

Quercus Robur L., c. *sessiliflora*.—Between Tresarret and Dunmeer Bridges; between St. Teath Mill and St. Tudy.

Betula alba L., b. *glutinosa*, and c. *pubescens*.—Both these vars. between Tresarret and Dunmeer Bridges.

Populus tremula L.—In two hedges near St. Tudy Village, where it is likely to have been originally planted; also a tree between that place and Highway. In some parts of Devon and Cornwall the aspen is certainly indigenous.

Zannichellia palustris L.—In two ponds at Amble, with *Callitriche obtusangula.*

Orchis maculata L.—A plant of the form with spotless leaves noticed between Camelford and the hamlet of Helstone.

Habenaria chlorantha Bab.—Blisland, by the road to Trewardale; Camel Valley, near Dunmeer. Many plants by the Camelford Road at Michaelstow, growing in elevated waste spots, where I should have expected *H. bifolia* rather than this species.

Tamus communis L.—Between Blisland and Camelford; near St. Tudy.

Juncus squarrosus L.—On the down by the Jubilee Rock.

Carex vulpina L.—Between Amble and St. Minver.

C. muricata L.—By the Blisland and Camelford Road; between St. Tudy and St. Teath; St. Minver.

C. pilulifera L.—Beacon Hill, Bodmin; Michaelstow.

C. lævigata Sm.—Bog near Wringford.

C. binervis Sm.—On the down by the Jubilee Rock, Blisland.

C. flava L., b. *lepidocarpa*.—Near Michaelstow.

C. hirta L.—Amble.

Agrostis setacea Curt.—Beacon Hill, Bodmin; on the down by the Jubilee Rock, Blisland; Michaelstow.

A. canina L.—Michaelstow.

Milium effusum L.—Blisland, by the lane leading towards Trewardale. There seem to be very few Cornish stations recorded for this grass.

Aira præcox L.—On the down by the Jubilee Rock, Blisland.

Bromus asper Murr.—By the road near Cakeval, St. Kew, where *Aspidium aculeatum* occurs (Journ. Bot. 1882, 238). Not noticed elsewhere in the tract. This species is often of local distribution.

B. racemosus L.—Between St. Kew and the Wadebridge and Camelford Road.

B. commutatus Schrad.—Between Amble and St. Minver.

B. mollis L., b. *glabrescens*.—In a corn-field at Hengar, St. Tudy.

Lomaria Spicant Desv.—By the Blisland and Camelford Road. In a lane near the Jubilee Rock, Blisland, this is found associated with the following ferns:—*Athyrium Filix-fœmina*, two forms; *Nephrodium Filix-mas* c. *Borreri*, *N. dilatatum*, *N. æmulum*, and *N. Oreopteris.*

Asplenium lanceolatum Huds.—Bodmin, on several walls very near the town; Pendrief, Blisland; between Blisland and Hengar, by the road to Camelford.

Aspidium angulare Willd.—Near the Jubilee Rock, Blisland; St. Tudy; St. Teath; between Amble and St. Minver.

Nephrodium Filix-mas Rich., c. *Borreri*.—Common. This variety seems to be frequent throughout Devon and Cornwall.

N. æmulum Baker. — Helland; about Camelford; near St. Teath Mill.

N. Oreopteris Desv.—Helland. In one place between Wineford and Camelford.

Osmunda regalis L. — Bog near Wringford, on the right of the road from St. Tudy to Poleys Bridge.

LOCAL CATALOGUES USED IN PREPARING WATSON'S 'TOPOGRAPHICAL BOTANY.'

By B. Daydon Jackson, Sec. L.S.

Since the recent publication of the second edition of Watson's 'Topographical Botany' it has been suggested that an account of the lists and similar material upon which that work was based would be acceptable to British botanists. I have therefore made an enumeration of the various local lists and MS. floras, which are preserved in the Library of the Kew Herbarium, using the titles as written upon them by Watson himself, and closing with a local index to the names mentioned. The running numbers correspond to the number in pencil on each article.

There are extant two interleaved copies of the first edition of 'Topographical Botany,' with considerable additions by the author, but they are not precisely alike as to the contained entries; one of these is in the Library at Kew, the other is the private property of Mr. J. G. Baker. Besides these, there are eight quarto volumes, consisting of sheets with the numbers of each county and vice-county, three folio volumes lettered 'Cybele, Census of Species,' and three others styled 'Cybele, Topographical Botany.' These were the scaffolding by means of which Watson elaborated the works by which he will be enduringly remembered. The dates of the copies of 'London Catalogue' he used will be of interest, as showing his systematic method of working by means of trustworthy correspondents. The whole of his papers and catalogues were loose (for intercalation) during his lifetime, but have been bound since their transfer to Kew. I may also mention that a very large number of labels, arranged and numbered in proper order, may be seen on the shelves of the Library; they seem to have been the foundation for his 'New Botanist's Guide.'

Whilst I am writing it may not be out of place to state that the date of Hewett Cottrell Watson's birth was May 9th, 1804, according to the tombstone in Thames Ditton Churchyard.

Lettered "Misc. Botan. Lists." 8vo.

1. Britten's List of Lincolnshire Plants from White's History, Gazetteer and Directory, ed. 3. 1872.

The plants seen by the author are marked.

2. Caldecott Museum Report [1873]. No Botany.

3. Eastbourne Nat. Hist. Soc., Oct. 17th, 1873.

Contains: A few notes on the Flora of Eastbourne, as compared with that of South-Western Surrey. By F. C. S. Roper.

4. Ditto. Oct. 13th, 1874.

Contains: Notes on the Flora of Eastbourne, as compared with that of West Kent and West Surrey. By F. C. S. Roper.

5. 5th Annual Report of the Eastbourne Nat. Hist. Soc. 1872.

6. [Prospectus]. Fauna and Flora of Hastings and St. Leonards and the Neighbourhood. [1876].

7. Somerset Archæological and Nat. Hist. Soc. Frome, August, 1875.

Contains: The Flora of the Eastern Border of Somerset. By Dr. Parsons.

8. Worcestershire Naturalists' Field Club.

The proceedings at the third meeting. [1875].

9. Notes on British Gentianaceæ. By James Britten.

Proof-sheet of article in Journ. Bot. 1872, p. 166.

10–12. Floral Calendars for May–Sept. [at Plymouth], 1846. By J. W. N. K[eys].

Forming part of the South Devon Literary Chronicle.

13. The Botanists' Guide to the Counties of Aberdeen, Banff, and Kincardine. By G. Dickie.

Proof-slip of a review.

14. Letter from William Andrews, of Dublin, enclosing the following:—

15. MS. copy of Notes on the Irish species of the Saxifrages. Brit. Assoc., Cambridge, 25th June, 1845.

16, 17. Localities of British Plants, extracted from the MS. additions to Mr. Winch's Copy of Flora Brit. of Smith.

MS. in Watson's handwriting; the book from which it was made is in the Library of the Linnean Society. 17 has some additions at the end from (apparently) other sources.

18 & 19. Extracts from Alph. DeCandolle's 'Mém. sur la Géographie des plantes de France, considerées dans ses rapports avec la hauteur absolue.'

The heights given in metres have been reduced to English feet.

20. Extr. from Sommerfelt's 'Supplementum Floræ Lapponicæ, Christiania.' 1826.

21. List of plants growing about Bungay, in the County of Suffolk. Danl. Stock, 13th May, 1834.

Watson has added some notes from Stock's list made in 1851, of plants found within four miles of Bungay.

Lettering "LOCAL CATALOGUES. CHECKED BY H. C. WATSON."[4] 8vo.

Botanical mem., 1833:—May 15th, Barnstaple to Bristol; 16th, Birmingham to Manchester; 18th, Manchester to Keswick; 19th–21st, Keswick; 22nd, Hills between Derwentwater and Thirlmere; 27th, summit of Skiddaw; 29th, Saddleback; 31st, Helvellyn. June 4th, Keswick to Whinlatter Turnpike, thence to Grisedale Pike; 5th, Lowdore; 6th, Scawfell Pikes; 10th, Crummock.

22. Plants observed on and near the summit of St. Catherine's Down, Isle of Wight. May, 1840.

Twenty-two plants specified.

23. Llangollen, 1832.

Fourteen plants in list.

24. Somersetshire. Plants observed in travelling by mail from Bristol to Taunton in 1831.

25. Dartmoor, Devon.

26. At Truro.

27. Penzance. Plants of frequent occurrence about there.

28. List of plants seen about Dalwhinnie Inn, Inverness-shire, and mountains adjacent.

29. Plants seen near Dalnacardoch Inn, Perthshire, in July, 1841.

30. List of plants seen near the inn at Lochearhead, Aug., 1841.

31. Plants seen near Killin in Aug., 1841, and June, 1832.

32. Plants seen on the north side of Callander in August, 1841.

33. Plants observed on the Castle Rock, at Stirling, Aug., 1841.

34. On and near the south side of the Ochills, near Alva, July, 1841. Specimens of all the species seen by myself taken.

35. Plants seen on the Pentland Hills, near Swanston. July, 1841.

36. List of plants observed about Perth, and Kinnoul on the opposite side of the Tay. July, 1841.

37. Clova and vicinity in 1832.

Re-marked in 1844.

38. List of plants noticed about Castleton, in Braemar, 1832.

Re-marked also for 1844. See Catalogue.

39. List of plants observed in the North of Sutherland in August, 1832.

40. List of plants observed in driving from Thurso to Sandside Bay, Caithness, July, 1831.

41. List of plants seen about Golspie, in Sutherland, Aug., 1832.

42. Plants observed about Kessock and Dingwall, in the east of Rossshire, in August, 1832.

43. Plants seen near Inverness in July, 1832.

44. Plants observed by the road in walking from Kingussie to Dalwhinnie.

45. Plants seen about Lochiel and Ben Nevis in August, 1832.

46. Plants observed near Dumbarton, 1832.

47. Plants omitted in the list of Killin [No. 31].

48. Miscellaneous notes on localities, &c., 1832.

Contains profiles of mountain groups.

49. Localities about Llangollen. 1832.

50. List of plants observed about Chatham in September, 1843.

51. L. C., ed. 3. Jersey, 1832. H. C. W.

52. ,, ed. 6. Penzance and elsewhere in Cornwall, 1831 or 1842. H. C. W.

53. L. C., ed. 4. Isle of Wight, Freshwater, August, 1861. H. C. W.

54. L. C., ed. 6. Deal and vicinity. [No date].

55. ,, ed. 1. Middlesex, between Staines and Twickenham. [No date].

56. L. C., ed. 5. Berkshire. [No date].
57. ,, ed. 3. Near Peterboro', northern side of Nene. [No date].
58. ,, ed. 3. Near Peterboro', Hunts side of Nene.
59. ,, ed. 1. Himley, Staffordshire.
60. ,, ed. 3. Near Lincoln town.
61. ,, ed. 3. Neighbourhood of Boston, Lincolnshire.
62. ,, ed. 3. Thorpe Station, Lincolnshire.
63. ,, ed. 3. Grimsby and Clea, Lincolnshire.
64. ,, ed. 3. Neighbourhood of Louth, Lincolnshire.
65. ,, ed. 4. Prestwich.
66. ,, ed. 3. Lancaster, near town, 1857. West Lancaster, 1856.
67. L. C., ed. 4. Westmoreland and Kendal.
68. ,, ed. 2. Shap, 1857 and 1856, and vicinity.
Separate indications for Rossgill, Swindale, Shap Abbey, and Mardale.
69. L. C., ed. 4. Shap and vicinity, 1856.
Above Shap, extending to Orton, Crosley, and Haweswater.
70. L. C., ed. 2. Mardale and hills above.
71. ,, ed. 1. Species observed in Glen Shee, Perthshire, August, 1844.
72. L. C., ed. 1. Glen Clova [and] Rocks of Canlochan Glen, seen in 1844.
73. L. C., ed. 1. Castletown, &c., Braemar, 1844. [With indications of a few noticed in 1832].

(To be continued.)

SHORT NOTES.

Gnaphalium dioicum in Hants.—I have lately received from the Rev. William L. W. Eyre, of Swarraton Rectory, Alresford, specimens of *Gnaphalium dioicum*, of which he informs me he has found a considerable patch in the parish of Swarraton, and in a situation which would warrant its being held as indigenous. This adds another species to the Flora of Hampshire, bringing those of Mr. Watson's Scottish type to the number of 15 instead of 14.—Fredk. Townsend.

Senecio viscosus in Cambridgeshire?—In the second edition of 'Topographical Botany' *Senecio viscosus* is not admitted as a Cambridgeshire plant. At page 225 Mr. Watson writes:—"The mistake of giving the name of this species to examples of *Senecio sylvaticus* has been so frequent that I hesitate to enumerate any of the following counties as certain," 29 then being given amongst many doubtful records. On turning to Professor Babington's 'Flora of Cambridgeshire' the plant in question is found to be inserted wholly on the authority of the older botanists—in this instance Ray and Relhan only; and at page 315, Appendix No. ix., it is included in the list which "contains the names of those plants

which, although recorded upon good authority as natives of Cambridgeshire, have not been found there for very many years." Ray, in his Cat. Pl. Cant., 1660, p. 154, gives as localities for his *Senecio hirsutus viscidus major odoratus*, "on all the Fen banks almost in the Isle of Ely"; and again in his Cat. Pl. Angliæ, 1670, "on the Fen-banks in the Isle of Ely, plentifully." In Relhan's Flora Cant., ed. 1 (1775), p. 315, the localities given for *Senecio viscosus* are "Gamlingay, Mepole, Chatteress"; and in the 3rd ed. (1820) he repeats the three localities with no further additions, but under the subsequent number gives *Senecio sylvaticus* (not mentioned in the 1st edition) as occurring at "Hildersham, on the Furze Hills." In Babington's 'Flora of Cambridgeshire' we find the localities for this latter species are—"1, Furze Hills, Hildersham; 3, Gamlingay," both given on his personal authority. During eight years' careful search with a view to rediscover *Senecio viscosus*, I have failed to find it on or about the fen banks or other ancient localities given by Ray and Relhan for the Isle of Ely; but *Senecio sylvaticus* has occurred plentifully in the parishes of Mepal, Chatteris, Sutton, Benwick, Wimblington, Manca, and March, in District 7 of the Flora of Cambs., and more rarely in Witcham Fen, in District 6. The question naturally arises—Has the one plant died out and been replaced by the other *in the same localities only*, or was there an error in the older records?—Alfred Fryer.

Rubus saxatilis in N. Devon. — My friend, the Rev. Ernest Ellman, has shown me a dried piece of *Rubus saxatilis* which he gathered in the valley of the East Lyn, near Brendon, North Devon, early in June last. He informs me that the plant occurs there in fair quantity.—T. R. Archer Briggs.

East Cornwall Plants.—On Sept. 14th Mr. Briggs and I were at Bude, and on Summerleaze Down found over a dozen small plants of *Erigeron acris*, a species which in 'Topographical Botany' (ed. 2) is not reported for East Cornwall. Earlier in the same day he had found on the other side of the bay about half a dozen patches of *Cardnus acaulis*, recorded in this Journal for 1873, p. 39, by the Rev. Dr. Hind from "Bude," but not treated as a Cornish plant by Watson. In the same locality were a large number of plants of *Gentiana Amarella*, which appears not to have been before met with anywhere further east in the county than the neighbourhood of Truro (see Keys' 'Flora of Devon and Cornwall'). — W. Moyle Rogers.

A Suggestion.—Will you allow me to suggest that it would be well for those who record new, "critical," or rare species of British plants in the 'Journal of Botany,' to send confirmatory specimens to be placed in the National Herbarium at the British Museum? The pursuance of this plan would not only afford additional security against false records, but it would enable those botanists who are unable or unwishful to avail themselves of Mr. F. A. Lees' able censorship to establish, on occasion, their right to priority of record. I have set aside and will forward to you for the National Herbarium specimens of such plants as I have recorded in your pages, and on

the tickets I propose to write, in addition to the usual information, the names of those botanists who have helped me to determine the critical species.—Alfred Fryer.

[Mr. Fryer's suggestion is an excellent one, and we shall be glad if our readers will act upon it. The British Herbarium of the Natural History (British) Museum is now very extensive, a circumstance largely owing, so far as more recent accessions are concerned, to the thoughtful liberality of many of our contributors.—Ed. Journ. Bot.]

Vicia Orobus DC. in S. Devon. — On p. 316 I spoke of Mr. Husband's N. Devon station as "the only one yet known for that county." This is an error. In the 'Botanical Record Club Report for 1879' it is recorded for S. Devon (from Anstey's Cove, Torbay) by Mr. Rossall. Probably it will yet be found elsewhere in both counties.—W. Moyle Rogers.

New Surrey Plants.—The following additions to the county lists have recently come under my notice:—*Viola lactea* Sm. Turfy ground, Copthorne. I first observed the withered leaves of this species in November, 1882, and have this year found it in several places in the neighbourhood. It also occurs on that part of Copthorne Common which is in Sussex, for which county it is the most northerly record. — *Stellaria umbrosa* Opitz. Shady banks between Wootton Hatch and Shalford. Certainly a rare species in the county; I know of no station for it but the above, in which it is abundant. — *Arctium nemorosum* Lej. Not unfrequent in thickets on the chalk range, occurring also about Leigh, and at Ockley. The distribution of this genus is but imperfectly worked out as yet. —*Gnaphalium uliginosum*, var. *pilulare*. Roadside between Leigh and Newdigate. Numerous specimens have been examined by Mr. A. Bennett and myself without detecting the variety, until this year, when I found it in the above station, where it occurs sparingly with the type.—*Hypochæris glabra*, var. *Balbisii*. Fallow field near Send. Found by Mr. Thomas Howse, growing with *Silene conica*. The latter undoubtedly, both perhaps, introduced.—*Potamogeton Zizii* M. & K. Hedge Court Mill-pond, near Felbridge. This species has escaped notice until this year, when, the water being very low, I found it in abundance. Floating leaves are freely produced in this station.—*Alisma lanceolatum* With. Probably widely distributed, but not so common as *A. Plantago*. I have seen it at Brockham Bridge, Weybridge, and near Pirbright.—*Rhynchospora fusca* Röm. & Sch. Bog on Thursley Common, near Farnham. Found last summer by Mr. E. S. Marshall. I visited the locality in August, and found the plant to occur in the greatest profusion, but apparently confined to the bog in which Mr. Marshall first observed it. Interesting as an eastward extension of the range of a purely western plant, and the best addition to the county list that has been made for some years. The occurrence of this plant is suggestive, and a careful examination of the heaths and commons which cover so large a portion of the south-western corner of the county would very probably be rewarded by the discovery of other Hants plants.—W. H. Beeby.

On the generic names Dantia and Prouvenzalia.—In Bentham and Hooker's 'Genera Plantarum,' i. 788, there is given, as a synonym of *Ludwigia*, "*Dantia* Thou. Gen. Nov. Madag. n. 49, ex DeC., in opere tamen citato nomine deest," and, indeed, not being a Mascarene plant, it could not occur therein. The genus was originally published in the "Lettres d'un Médécin des Hôpitaux du Roy à un autre Médécin de ses Amis," of which a copy has been recently obtained for the Library of the Botanical Department of the British Museum. It is apparently a very scarce work, and was published at Namur in 1710. There is no author's name upon the title-page, but the work was written by François Pourfour du Petit. The first two letters are respectively upon the human brain and chemistry, the third "contient une critique sur les trois espèces de *Chrysosplenium* des Instituts de Mr. de Tournefort, trois nouveaux genres de Plantes, et quelques nouvelles Espèces." The three genera are *Dantia*, *Prouvenzalia*, and *Calamus*. *Dantia palustris* Petit (*Ludwigia palustris* Ell.) is quoted by Linnæus, Sp. Plant. ed. i., 1753, vol. i. p. 120, as "Dantia palustria Petit gen. 49, t. 49"; DeCandolle, Prod. iii. 61, alters it to "Du Petit Thouars gen. 49." Hooker, in the 'Genera Plantarum,' omits the "Du Petit," so that all trace of the connection of the name with the original paper is lost. The name was given in honour of "Mr. Danti D'Isnard," whom Linnæus subsequently commemorated by naming the same plant *Isnardia*. *Prouvenzalia palustris* was the name given by Petit to the plant now known as *Calla palustris* L., to commemorate M. de Prouvenza, Physician to the Duchess of Montpensier and one of his botanical friends. Linnæus quotes it (Gen. Plant. ed. i., p. 276; ed. vi., p. 471) as "*Provenzalia* Petit gen. p. 45," as a synonym of *Calla*. Adanson (Fam. Nat. ii. 469) copies this, and in the 'Genera Plantarum' it is quoted by Hooker from Adanson without any reference either to Linnæus or Petit, as if Adanson was the inventor of the name. *Calamus*, the third genus, is a synonym of *Acorus*, and is quoted by Linnæus (Gen. ed. i., p. 104) as "*Calamus Aromaticus* Petit gen." It is not mentioned in the 'Genera Plantarum.'—H. N. Ridley.

New British Plants. — Two very interesting additions to our British Flora were announced at the Southport Meeting of the British Association by the Ashton-under-Lyne Biological Society, viz., *Chara Braunii* Gmel., first found by myself and Mr. Armitage on August 28th, near Ashton-under-Lyne, whilst engaged in working up the flora of the district; and also a *Caulinia*, probably *alagnensis* Delile, found by Messrs. Lee and Bertenshaw September 1st, in the same locality.—John Whitehead.

[We hope to give figures and descriptions of these interesting plants in an early number.—Ed. Journ. Bot.]

British Desmidieæ.—Since the publication at pp. 290–292 of the notes on British *Desmidieæ*, I have been informed that *Micrasterias brachyptera* was gathered by J. Bisset, Esq.; and the Arran gatherings—*Cosmarium quadrifarium*, *Euastrum inerme*, and *Penium lagenariodes*—by Messrs. John and James Bisset.—W. Joshua.

NOTICES OF BOOKS.

Mr. J. G. Baker, of the Kew Herbarium, is intending to print this winter a Flora of the English Lake District, and will be glad to receive contributions towards it of new localities for the rarer species, and of local names.

We have received a pamphlet entitled 'Some Materials for a Flora of Wrotham and its neighbourhood' (West Malling, Chamberlain), compiled by the Rev. J. W. Ewing. The limits of the district to which it refers are not defined, and but few definite localities are given. The catalogue seems to be on the whole carefully compiled,—although we note one or two improbabilities, such as *Viola lutea*,—and is a useful addition to our Kentish lists. To *Linum catharticum* is appended a note which we do not remember having met with elsewhere—"A few stalks of this chewed when tired form an excellent 'pick-me-up'."

We are sorry to learn that the financial position of the Botanical Record Club is far from satisfactory, a considerable amount being due to the Treasurer. This is in great measure due to the small sale of the second edition of the 'London Catalogue of British Mosses'; and we draw attention to the circumstance in the hope of increasing its circulation.

The last part (xci.) of the 'Flora Brasiliensis' contains Dr. Urban's monograph of the Brazilian *Turneraceæ*.

The June number of 'Timehri,' the Journal of the Royal Agricultural and Commercial Society of British Guiana, contains a paper by Mr. G. S. Jenman on the India-rubber and Gutta-percha trees of that region.

A recently-issued 'First Supplement' to the 'Natural History of Hastings and St. Leonards' (Hastings, Daniel: pp. 53) contains some additions to the lists of Phanerogams, Mosses, Fungi, Lichens, and Algæ of the district, with a complete list of the Hepaticæ. The Rev. E. L. Bloomfield has compiled the lists from the observations of various correspondents.

New Books. — C. H. Delogne, 'Flore Cryptogamique de la Belgique' (Mosses: 8vo, pp. 114, 4 plates; Brussels, Manceaux).— C. Mangenot, 'Des Algues Utiles' (Paris, Doin: 8vo, pp. 88). — M. Granel, 'L'Ergot, la Rouille, et la Carie' (Paris, Doin: 8vo, pp. 82; 1 plate). — F. Hennéguy, 'Les Lichens Utiles' (Paris, Doin: 8vo, pp. 114). — F. Ardisone, 'Phycologia Mediterranea': i., Florideæ (Varese, Malnati: 8vo, pp. x., 516). — P. Duchartre, 'Éléments de Botanique' (ed. 3, pt. i., pp. 560: Paris, Baillière).— C. Luerssen, 'Die Pflanzen der Pharmacopœa germanica' (Leipzig, Haessel). — T. Twining, 'The Botanic Stand' (Bogue: 6*d.*). — A. Borzi, 'Studi Algologici' (4to, fasc. i., pp. vi., 117, tt. ix.: Messina, Capra).—R. Hess, 'Die Eigenschaften und das forstliche Verhalten der wichtigeren in Deutschland vorkommenden Holzarten' (8vo, pp. xii,, 164: Berlin, Parey). — P. Kumener, 'Der Führer in die

Flechtenkunde' (8vo, pp. 187, tt. 3: Berlin, Springer).—J. Wiesner, 'Elemente der Organographie, Systematik, und Biologie der Pflanzen' (8vo, pp. xii., 449: Berlin, Hölder, 1884).

Articles in Journals.—October.

American Naturalist.—E. J. Hill, 'Means of Plant Dispersion' (contd.).—L. P. Gratacap, 'Growth of Plants in acid solutions.'

Botanisches Centralblatt (No. 39). — J. E. Weiss, 'Das markständige Gefässbündelsystem einiger Dikotyledonen in seiner Beziehung zu den Blattspuren' (1 plate). — (No. 40). 'Polymorphismus von *Pleospora herbarum* Tul.' — (Nos. 41–43). C. Müller, 'Musci Tschuctschici' (many new species).

Botanische Zeitung (Sept. 28; Oct. 5, 12, 19). — O. Warburg, 'Ueber Bau und Entwickelung des Holzes von *Caulotretus heterophyllus*' (1 tab.). — (Oct. 19). J. Reinke, 'Untersuchungen über die Einwirkung des Lichtes auf die Sauerstoffausscheidung der Pflanzen.'

Bull. Soc. Bot. France (xxix., 5, 6: Sept.). — M. Battandier, 'Contributions à la Flore d'Alger' (concl.).—E. Heckel, 'Nouvelles Monstruosités Végétales' (1 plate).—P. Van Tieghem & L. Grignard, 'Le Mecanisme de la Chute des feuilles.' — P. Van Tieghem, 'Développement des *Chætomium*.' — C. Richon, 'Nouveau parasite du Blé.'—P. Duchartre, 'L'influence de la lumière sur la maturation du Raisin.' — —. Boullu, 'Découverte d'une hybride des *Linaria striata* et *vulgaris*' (*L. ambigua* Boullu). — G. Rouy, 'Herborisations à Lus la Croix-haute (Drôme) et à Peyruis (Basses-Alpes)' (*Rosa druentica* Rouy, *R. scopulorum* Rouy). — G. Bonnier, 'Cas Tératologique chez le *Daucus Carota*.'

Bull. Torrey Bot. Club (Aug.). — F. L. Scribner, 'Notes on *Spartina*' (1 plate). — E. L. Greene, 'New Western *Compositæ*' (*Brickellia Cedrosensis*, *Bæria carnosa*, *Lagophylla congesta*, *Senecio Clevelandi*, *S. Layneæ*, *S. Actinella*, *S. arizonicus*, *Microseris acuminata*, spp. nn.). — J. B. Ellis & B. M. Everhart, 'New Species of Fungi.'—S. B. Buckley, 'New Texan plants' (*Zanthoxylum texanum*, *Bumelia texana*, *B. monticola*, *Quercus Vaseyana*, spp. nn.). — E. J. Hill, · Potamogetons in W. New York.'

Flora (Sept. 11 & 21; Oct. 1). — F. Pax, 'Flora des Rehhorns bei Schatzlar.' — (Sept. 21). F. Körnicke, 'Die Gattung *Hordeum* L. in Bezug auf ihre Klappen und auf ihre Stellung zur Gattung *Elymus* L.'—(Oct. 1 & 11). P. Krüger, 'Die oberirdischen Vegetationsorgane der Orchideen in ihren Beziehungen zu Clima und Standort' (2 plates).—(Oct. 11). H. G. Reichenbach, 'Die Orchideen des Herbars Thunbergs.'—H. Braun, '*Rosa resinosa* Sternb.'

Garden (Sept. 29). — *Cladrastis amurensis* (fig.). — *Phalænopsis Sanderiana* (ic. pict.). — (Oct. 6). *Escallonia Sellowiana* (fig.). — *Androsace foliosa* (ic. pict.).

Gardeners' Chronicle (Sept. 29). — W. B. Hemsley, 'Vegetation of Australia.' — *Maxillaria varicosa* Rchb. f., sp. n. — F. C.

Lehmann, '*Odontoglossum crispum*, var. *Lehmanni* Rchb. f.' — *Gentiana ornata* (fig. 60). — *Corynocarpus lævigatus* (fig. 61). — M. Foster, 'Notes on Irises' (concl.). — (Oct. 6). *Lælia Wyattiana* Rchb. f., 'nov. hybr. nat.' — *Vanda Sanderiana* (figs. 67, 68). — (Oct. 13). *Aerides Lawrenciæ* Rchb. f., n. sp. — W. B. Hemsley, 'Seed-vessels of Australian trees.' — H. G. Reichenbach, '*Vanda Sanderiana* and *Masdevallia racemosa*. — M. C. Cooke, 'Woolhope Fungus Foray.' — (Oct. 20). 'A new hybrid *Hedychium*.' — *Pyrus pinnatifida* (fig. 78). — *Dendrobium polycarpum* Rchb. f., n. sp. — *Maurandya erubescens* (fig. 81). — (Oct. 27). *Dammara australis* (fig. 86). — *Pentstemon labrosus* (fig. 91).

Journal of Quekett Microscopical Club.—M. C. Cooke, 'Biological Analogies.'

Midland Naturalist. — J. E. Bagnall, 'Flora of Warwickshire' (contd.: *Gentianeæ—Scrophularineæ*).

Naturalist. — J. Cash, 'William Wilson's Tours in Ireland and Scotland.'—W. Fowler, 'Lincolnshire Plants.'

Nuov. Giorn. Bot. Ital. — A. Piccone, 'Appendice al 'Saggio di una bibliografia algologica Italiana' del Prof. Cesati.'—H. Christ & L. Caldesi, '*Belleralia Webbiana* Parl.' — A. Goiran, 'Nuova specie di Orchidacea' (*Platanthera Carducciana* Goiran). — L. Nicotra, 'Prime Linee di Briologia Sicula.'

Œsterr. Bot. Zeitschrift.—L. Celakovsky, 'Ueber einige Stipen.' — H. Sabransky, '*Urtica radicans* Bolla.' — D. Hirc, 'Aus dem croatischen Litorale.'—P. G. Strobl, 'Flora des Etna' (contd.).

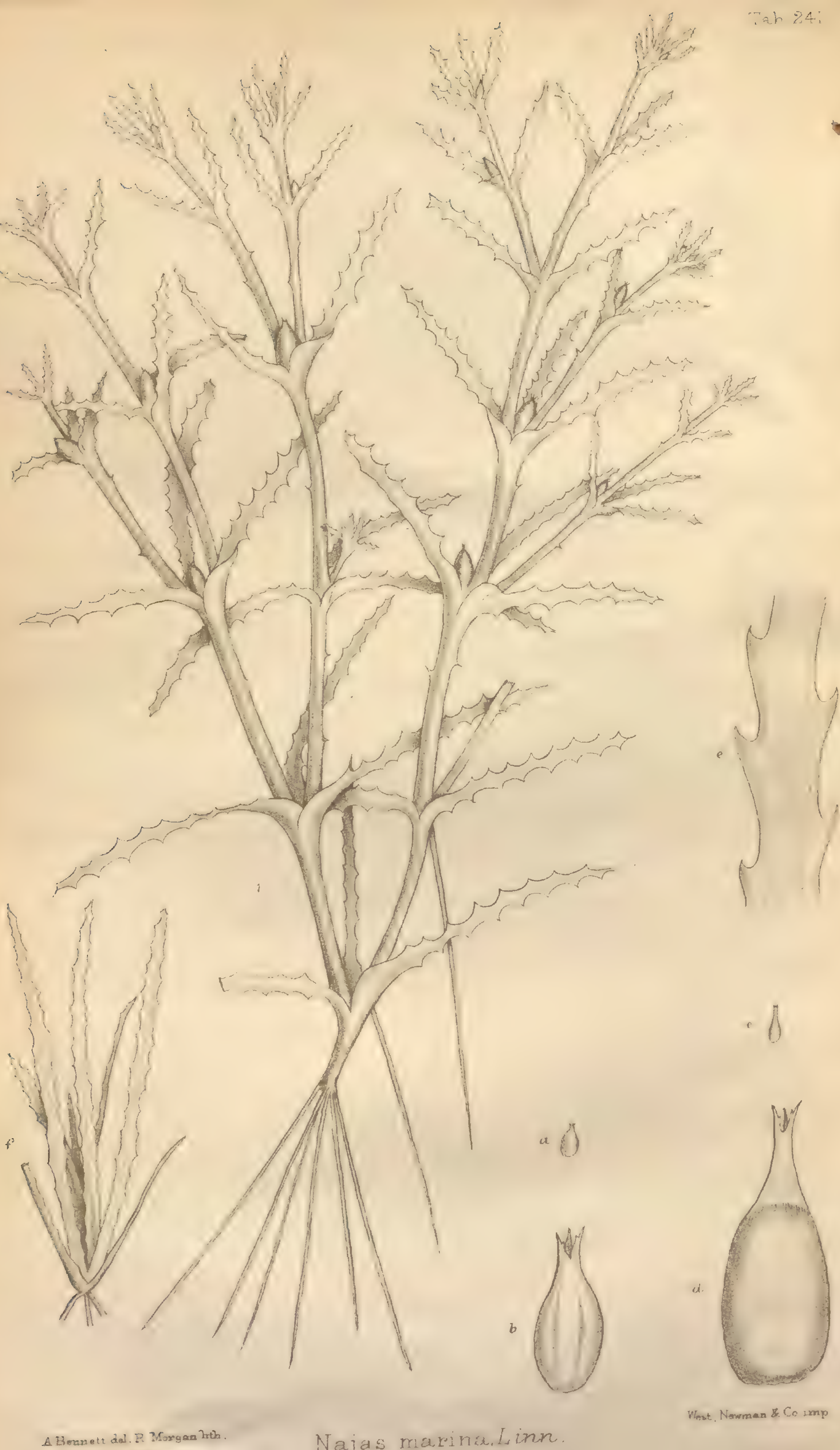
Proc. Linn. Soc. N. S. Wales (June 19).—J. E. Tenison-Woods, 'Coal-flora of Australia' (11 plates). — B. Scortechini, 'Contributions to Flora of Queensland.' — C. Kalchbrenner, 'Two New Fungi' (*Polyporus Pentzei* Kalchb., *Paxillus hirtulus* F. Muell.) — (July 17). E. Haviland, Sydney Plants.—B. Scortechini, 'Plants new to S. Queensland.'

Revue Mycologique. — C. Roumeguère, 'Fungi Gallici exsiccati cent. xxvii.' (*Trametes tristis*, sp. n.).—Id., 'Champignons nouvelles ou rares' (*Flammula Sarrazini*, sp. n.). — Id. & P. A Saccardo, 'Reliquiæ Libertianæ,' Ser. iii. (3 plates: many new species). — —. Feuilleaubois, 'Remarques sur le développement du *Phallus impudicus*.' — E. Schulzer von Muggenburg, '*Polyporus Sarrazini*, n. sp.'

Rochester Naturalist.—C. H. Fielding, 'Kentish Orchids.'

Science-Gossip. — G. Massee, 'A Gossip about Fungi.' — W. West, 'Botanical Rambles from Bradford.'

Scottish Naturaiist. — 'Hints on formation of a Herbarium.'— W. Durie, 'Plant-Names.' — W. J. Fortescue, 'Flowering Plants and Ferns of Orkney' (contd.). — J. Stirton, 'Notes on *Usnea*' (many new species).—J. W. H. Trail, 'Heterœcism in the Uredines.' —J. Stevenson, 'Mycologia Scotica' (contd.).



A Bennett del. R Morgan lith.

Najas marina. Linn.

West, Newman & Co imp

ON *NAJAS MARINA* L. AS A BRITISH PLANT.

By Arthur Bennett, F.L.S.

(Plate 241.)

Those who have followed the progress of British Botany during the last two or three years cannot fail to have been struck with the special attention which has been given to water-plants, and to the interesting results which have rewarded the investigations of the Messrs. Groves into the British *Characeæ*, as well as those to which I have been able to bring into notice in the *Naiadaceæ*. That this source of interest is not yet exhausted is evident from the note at p. 349 of this Journal, recording the discovery of another Chara and Naias new to Britain. Only a short time before, I had the pleasure of recording (p. 246) the discovery in England of the subject of the present paper. It occurred in one place at Hickling Broad, East Norfolk; in good quantity, and elsewhere rarely, for about the length of a mile. With it were growing *Potamogeton pectinatus*, *Chara stelligera*, *C. polyacantha*, *C. hispida*, &c. By far the greater portion of the bottom of Hickling Broad is covered by a dense growth of *Chara aspera*, and I think it must be this plant—which grows literally by the acre!—to which Mr. T. Southwell refers in Lubbock's 'Fauna of Norfolk,' ed. 2, p. 137. Mr. Lubbock speaks of the water at Hickling Broad being "shallow, and abounding with a particular weed, Pochard Grass as it is called," on which the Pochard Duck is accustomed to feed; and Mr. Southwell adds, "I cannot discover to what plant this name was applied; probably it was given to some species of *Potamogeton*." The *Najas* since has been collected by Mr. H. Groves, and Messrs. B. King and Druce. The following bibliography of the species may be useful:—

Najas marina L. Sp., ed. i., p. 1015; ed. ii., p. 1441 (excluding varieties); Nyman, Consp. Flor. Europ., p. 685; Hartman, Handb. Skand. Fl. (1879), p. 403; Ascherson, Fl. Brandenb. (1864), p. 669.

Najas major Allioni, Fl. Pedem. (1785), ii., p. 221; A. Gray. Man. N. United States, ed. 5 (1878), p. 483; Arcangeli, Comp. Fl. Ital. (1882), p. 645; Kunth, Enum., iii., p. 112; Boreau, Fl. Centre, ed. 3 (1849), p. 603 (*Naias*); Grenier & Godron, Fl. France (1855–6), iii., p. 322; Lloyd, Fl. de l'Ouest, ed. 3 (1876), p. 296 (*Naias*); Roth, Tent. Fl. Germ., ii., pt. 2, p. 499 (*Naias*); Koch, Syn. Fl. Germ., ed. 2 (1844), p. 783 (*Naias*); Al. Braun, Journ. Bot. (1864), p. 274.

N. monosperma Willd. Sp. Pl. iv., p. 331.

N. fluviatilis Lam., Encycl., iv., p. 416 (1796).

N. fluvialis Thuill. Fl. Par. (1799), p. 510.

N. intermedia Wolfg., in Eich. Nat. Skizz., p. 126.

N. muricata Thuill.! (non Delile), Fl. Par., p. 509.

Figures:—Flora Danica, t. 2121; Vet. Acad. Hand., 1837 (38), t. 8, p. 241; Linnæa, ix. (1834), t. 7 (♀), x. (1836), t. 1 (♂).

Structure, &c.:—Jahrb. für Wissensch. Bot. (1858), t. 7, fig. 11–13; Magnus, Beitr. Kenntn. Naias, Berlin. (1870).

Distribution:—Europe. Norway!, Denmark, Sweden!, Slesv.-Holstein!, Belgium!, Holland, France!, Spain, Germany!, Switzerland!, Italy!, Hungary!, Austria!, Transsylvania! and adjoining states, N. Russia!, Lithuania!.

Asia. Siberia!, Afghanistan!, Tibet!, Arabia!, Caucasus!.

Africa. (Bourbon!, same species?)

America. N. United States! (rare), Florida!, W. Indies!.

Australia. Sandwich Isles!.

Exsiccata:—Fries, Herb. Nov. iv., 84!; Hansen, Herb. Slesv.-Holstein, 948!; Wirtgen, Herb. pl. sel. Rhen., ed. 2, 523!; Herb. pl. crit., 247!; Reich., Fl. Germ., 560!, 1102!; Billot., Fl. Gall. et Germ., 2383!; Meinshausen, Fl. Ingrica. Cat., x.!; Curtis, N-American Plants, 2705!.

Plant entirely submerged. Roots simple, long, from the base and lower nodes. Stem 3 in. to 9 in. in British specimens (simple in small examples), branching from the base, with scattered broad-based teeth. Leaves opposite, linear, $\frac{1}{2}$ in. to 2 in. long, repand-dentate; teeth mucronate; the apex, when fresh, purplish. Sheaths entire. Flowers dicœcious, axillary, solitary, half enclosed in the sheathing base of the leaves. Female flowers with 2–3 stigmas. Male flowers oblong, with the anthers enclosed in a thin sac, 2–3-toothed, and bursting irregularly at the top. Fruit $\frac{1}{4}$ in. long, ovate-oblong, purplish when fresh, changing to a reddish brown.

The species is somewhat variable, the marine forms having less dentate leaves and longer internodes. In Sir J. E. Smith's Herbarium at the Linnean Society is a specimen ticketed "Isle de Bourbon, H. L. fil."; this I have little doubt is the same as one in the Kew Herbarium named "*N. palustrina* Commerson; in Bor-bonia, Commerson," and is probably *marina*.

N. intermedia Wolfgang comes in habit about half-way between *N. marina* and *N. minor* All. (*Caulinia fragilis* W.), but is referable to *N. marina*. Thuillier's specimens in Herb. Mus. Brit., named by himself, seem only local states of the plant. *N. minor*, from its European distribution, may be found in Britain, as it occurs in Germany, Holland, Belgium, and France, but is wanting in the Scandinavian countries, except Finland.

The plate gives the impression of a plant somewhat more robust than usual; but our British plant is much stouter than any others I have seen; and herbarium specimens lose much of their bulk in drying. The one drawn was quite as stout as the figure when fresh and floating in a white shallow dish—too great depth of water magnifies plants.

Explanation of Plate 241.—1, Specimen of whole plant from Hickling Broad, Norfolk. 2, Male flower, magnified. 3, Male flower, natural size. 4, Portion of leaf, magnified. 5, Female flower, magnified. 6, Female flower, natural size. 7, Young plant (copied from Fl. Danica, t. 2121).

SPICILEGIA FLORÆ SINENSIS: DIAGNOSES OF NEW, AND HABITATS OF RARE OR HITHERTO UNRECORDED, CHINESE PLANTS.—VIII.

By H. F. Hance, Ph.D., Memb. Acad. Nat. Cur., &c., &c.

(Concluded from p. 312).

66. **Strobilanthes** (Goldfussia) **dimorphotrichus**, sp. nov. — Caulibus flexuosis hispidulis, foliis elliptico-lanceolatis basi cuneatim attenuatis apice acuminatis anguste calloso-serratis flaccidis supra opacis pilis minutis albis appressis oculo armato tantum perspiciendis dense obsitis aliisque majoribus 2–3 articulatis articulo terminali angustato rarius conspersis subtus pallentibus præter costam strigillosam glabris inæqualibus altero 2 poll. petiolo 5 lin. altero opposito 5–9 lin. longo, capitulis axillaribus bifloris pedunculo communi apicem versus sensim incrassato folium dimidium circ. æquante fultis, bracteis ovatis subito breviter acuminatis glaberrimis deciduis, calycis segmentis linearibus glanduloso-pilosis 3 lin. longis, corolla rectiuscula 16 lin. longa parce pilosula, staminibus anticis faucem posticis mediam corollam attingentibus, stylo vix exserto.

Secus fl. Lien-chau, in silvula umida ad Fuk-shan-man, 300 m. p. a Cantone, d. 25 Oct. 1881, coll. rev. B. C. Henry. (Herb. propr. n. 22110.)

67. *Sphenodesma unguiculata* Schauer. — Juxta pagum Ta-mau-tin, in jurisdictione indigenarum ins. Hai-nan, Lai dictorum, copiose super Bambusas scandentem, d. 14 Nov. 1882, legit rev. B. C. Henry. Hitherto found, I believe, only in Eastern Bengal and Tenasserim. Mr. Henry describes the flowers as white and fragrant.

68. *Plectranthus* (*Isodon*) *Gerardianus* Benth.—Ad rupes umbratas faucium Yeung-tai, secus fl. Lien-chau, 290 m. p. a Cantone, d. 12 Oct. 1881, leg. rev. B. C. Henry. Only hitherto known from the mountains of India. The specimens agree entirely with Kashmir ones collected by Dr. Thomson.

69. *Dysophylla tetraphylla* Wight. — Juxta oppidum Hoi-hau, ins. Hai-nan, æst. 1879, coll. am. T. L. Bullock. Agrees well with Wight's description and plate (Ic. pl. Ind. or. iv. t. 1444).

70. *Polygonum* (*Aviculuria*) *aviculare* L.—Ad Ha-mi, Turkestaniæ chin., Maio 1881, coll. W. Mesny.

71. *Polygonum* (*Tovara*) *filiforme* Thunb.—In montibus Lo-fau-shan, prov. Cantonensis, d. 22 Sept. 1882, leg. rev. E. Faber. Found in the Kiu-Kiang hills by Dr. v. Moellendorff, but not hitherto known from the neighbourhood of Canton, which lies six degrees further south.

72. *Rheum? uninerve* Maxim.—In Ko-ko-nor, a. 1881, coll. W. Mesny. The solitary specimen agrees very well with Maximowicz's brief diagnosis (Mél. biol. Acad. sc. St. Pétersb. x. 685).

73. *Machilus rimosa* Bl. — In ins. Formosa, juxta Tam-sui,

ineunte Januar. 1882, florentem invenit T. Watters. Fine specimens, showing well the beautifully velvety bud-scales. Mr. Watters says the Chinese in Formosa call it "mountain tea."

74. **Litsea** (Conodaphne) **verticillata,** sp. nov. — Arborea, ramis dichotomis, ramulis tetragonis dense ferrugineo-hirsutis demum glabratis, foliis 4–5 verticillatis subsessilibus lanceolatis v. lanceolato-oblongis basi obtusis apice sensim acuminatis supra præter costam paulo prominulam pilosam sparsim hirtellis mox glabratis olivaceis subtus cæsiis costa nervis venisque eleganter reticulatis ferrugineo-hirtis 4–9 poll. longis $\frac{3}{4}$–2 poll. latis, capitulis ♂ 2–10 ramulos terminantibus pedunculis $\frac{3}{4}$–1 poll. longis suffultis, involucro 5–7 phyllo extus cano-sericeo, perianthii tubo extus villoso segmentis 6 plane evolutis tenuibus lanceolatis extus secus lineam medianam villosis, staminibus 9 exsertis filamentis pilosis.

Ad pagum Yün-ha-tin, 10 m. p. a Cantone, septentrionem versus, d. 17 Nov. 1881, coll. rev. B. C. Henry. (Herb. propr. n. 22051.)

75. *Elæagnus orientalis* L. — In paradiso regio, Ha-mi, Turkestaniæ chin., Maio 1881, leg. W. Mesny.

76. **Loranthus** (Cichlanthus) **notothixoides,** sp. nov. — Ramulis teretibus cinereis glabris novellis cum inflorescentia tota pilis ramosis fulvis dense tectis, foliis tenuibus suboppositis confertis eximie obovatis apice rotundatis basi cuneatis utrinque pilis fulvis stellatis obsessis 8 lin. longis $4\frac{1}{2}$ lin. latis petiolo $1\frac{1}{2}$ lineali, pedunculis axillaribus bifloris linealibus bracteis spathulatis calyci æquilongis stipatis, floribus brevissime pedicellatis, calycis limbo truncato, corollæ tubo gracili superne sensim paulo ampliato 10 lin. longo lobis 4 cochleariformibus intus glabris 3–4 lin. longis, genitalibus corollam adæquantibus.

In arboribus ad muros oppidi Lam-ko, ins. Hai-nan, m. Octobri 1882, leg. rev. B. C. Henry. (Herb. propr. n. 22169.)

A handsome species, with the aspect of the Ceylon *Notothixos floccosus* Oliv.

77. *Balanophora fungosa* Forst. — In jugo Lo-fau-shan, prov. Cantonensis, m. Sept. 1882, leg. rev. E. Faber.

78. *Balanophora indica* Wall.—Cum præcedenti. The specimens of these two plants having been dried without pressure, and none preserved in alcohol, I have not been able satisfactorily to examine the floral structure, but the first is certainly bisexual, and agrees entirely in aspect with a New Caledonian example (Vieillard n. 1122). The second is also, I think, referable to Wallich's species, of which, however, I have seen no authentic specimen, though I have carefully consulted Sir J. Hooker's beautiful memoirs (Trans. Linn. Soc. xxii. 1, sqq., 425, sqq.).

79. *Pilea bracteosa* Wedd. ? — In ins. Formosa, juxta Tam-sui, Feb. 1882, leg. T. Watters. Apparently identical with the Khasia plant, with which it agrees in its scarious ovate acuminate stipules.

80. *Elatostematis*, sp. nov. ? — Ad rupes umbratas faucium Yeung-tin, secus fl. Lien-chau, 290 m. p. a Cantone, d. 12 Oct. 1881, leg. rev. B. C. Henry. Very close to *E. surculosum* Wight!

and perhaps only a variety, but the upper leaves are broader, more oblique, and quite destitute of the long acumen of that plant.

81. *Pouzolsia oralis* Miq.—Secus fl. West River, prov. Cantonensis, infra Mo-lam, d. 25 Maii 1882, leg. C. Ford. A native of the mountainous regions of India and the Malayan Archipelago, not heretofore recorded from China.

82. **Myrica** (Morella) **adenophora,** sp. nov. — Dioica?, ramulis teretibus novellis dense breviter crispulo-tomentosis glandulisque aureis conspersis, adultis glabris, foliis confertis coriaceis obovatis margine revolutis acutiusculis integerrimis v. apicem versus pauciserratis supra crebre impresso-punctatis punctis glandulam pallide luteam foventibus subtus glandulis aureis conspersis ceterum glabris nervis utrinque elevatis 6–12 lin. longis 4–5 lin. latis petiolo $1\frac{1}{2}$–2 lin. longo tomentoso, amentis masculis simplicibus solitariis densifloris folio triplo brevioribus, floribus bractea ovata ciliata dorso dense aureo-glandulosa fultis, staminibus 6 bracteolis bracteæ consimilibus interstinctis.

In dicione Ting-on, ins. Hai-nan, m. Nov. 1882, leg. rev. B. C. Henry. (Herb. propr. n. 22159.)

A very neat shrub, apparently nearer *M. rubra* S. & Z.! than to any of the Indian or Malayan species. I have not seen female flowers.

83. *Dacrydium Beccarii* Parl.? — In jurisdictione Hung-mo, territorii indigenarum Lai dictorum, ins. Hai-nan, d. 21 Nov. 1882, invenit rev. B. C. Henry. The specimens are sterile, but such as they are, they agree perfectly with Parlatore's diagnosis of the species, hitherto only recorded from Borneo. Mr. Henry found it about five feet high, but adds that very large trees are said to grow in the mountains.

84. **Podocarpus** (Eupodocarpus) **argotænia,** sp. nov. — Ramulis angulatis lutescentibus, foliis oppositis patulis crassiusculis subfalcatis lineari-lanceolatis margine vix revoluto utrinque acutiusculis basi subtortis apice calloso-mucronatis pallide viridibus lucidis nervo supra vix prominente subtus sulcato stomatibus subtus fasciam candidam dimidium folii latitudinem occupantem efformantibus $2\frac{1}{2}$ poll. longis 4 lin. latis.

In jugo Lo-fau shan, prov. Cantonensis, sub fine m. Sept. 1882, leg. rev. E. Faber. (Herb. propr. n. 22121.) I have only a single sterile branchlet, but the plant is obviously new, and of great elegance, from the two broad rows of quite white stomata which, including the nerve, make the under surface of the leaf longitudinally 5-banded. It is evidently nearly allied to *P. macrophylla* Don, and *P. chinensis* Wall., which, notwithstanding M. Maximowicz's opinion (Mél. biol. Acad. St. Pétersb. vi. 562), I venture still to regard as distinct (and I may add that Mr. C. Ford has found the latter unquestionably wild amongst steep rocks on Victoria Peak, Hongkong, so that it is not a "varietas in hortis exorta"), and is in foliage rather more like the archipelagic *P. polystachya* R. Br.

85. *Zingiber corallinum* Hance.—Specimens of this, raised from the seeds gathered by Mr. Hancock, having flowered with me, I am now enabled to give a more complete diagnosis (Cfr. Spicil. fasc. v.

n. 50). Calyce tenuissimo spathaceo, corollæ lobis lanceolatis impari paulo latiore atro-sanguineis albido-guttatis labro ovato flaventi lobis 2 lateralibus parvis ovatis aucto, anthera pistilloque hispidulis, spicis floriferis anguste ellipsoideis 4–5 poll. longis scapo brevi squamoso fultis, bracteis viridibus ovatis, foliorum auriculis conspicuis obtusis.—When the fruit is ripening, the green bracts become of a brilliant coral-red colour.

86. *Phrynium capitatum* Willd. — Ad Fuk-wing, prov. Cantonensis, olim leg. b. R. Krone; secus fl. West River, m. Junio 1882, coll. operarius horti Hongkongensis.

87. *Iris ensata* Thunb. — In planitie circa oppid. Ha-mi, Turkestaniæ chin., Maio 1881, copiosam invenit W. Mesny.

88. *Fritillaria verticillata* Willd,, β. *Thunbergii* Baker. — In bambuseto collium juxta Mei-chi, ad austrum lacus Ta-hu, prov. Chê-kiang, d. 16 Apr. 1881, legg. Forbes et Carles.

89. *Disporum sessile* Don. — Cum præcedenti. Only previously known from Japan.

90. *Molineria recurvata* Herb. — Juxta pagum Sui-shi, secus fl. Lien-chau, prov. Cantonensis, 200 m. p. ab urbe, d. 5 Oct. 1881, leg. rev. B. C. Henry.

91. *Ophiopogon spicatus* Ker, β. *communis* Maxim.—Juxta Chin-kiang, prov. Kiang-su, Aug. 1880, leg. Bullock. Never previously, I believe, found except in Japan.

92. *Paris polyphylla* Sm.—In jugo Lo-fau-shan, prov. Cantonensis, exeunte Sept. 1882, leg. rev. E. Faber. A native of the mountainous districts of India, but had been already gathered in the provinces of Che-kiang and Kiang-su. Dodecandrous and hexagynous. The ovary is 5–6-sulcate and with 5–6 angles, so that it is star-shaped in a transverse section; the sides are green, but the conical top, ending in a stout column, is of a deep violet, rugose, and crowned by six black recurved stigmas; the gynæcium is scarcely more than half as long as the stamens. I have examined the living plant.

93. *Hydrilla verticillata*, ε. *crispa* Casp. — In fluvio Lien-chau, prov. Cantonensis, m. Oct. 1882, leg. rev. R. H. Graves.

94. *Vittaria japonica* Miq.—In jugo Lo-fau-shan, prov. Cantonensis, sub fine Sept. 1882, coll. rev. E. Faber. Apparently referable to this species, but they are all excessively difficult of discrimination.

95. *Gymnogramme serrulata* Bl. — In jugo Lo-fau-shan, prov. Cantonensis, d. 22 Sept. 1882, leg. rev. E. Faber. A widely diffused fern, which, though occurring in Japan, had not previously been detected in China. I prefer the specific name I have used to that of *javanica*, as implying no geographical restriction.

96. *Asplenium præmorsum* Sw. — In jugo Lo-fau-shan, prov. Cantonensis, m. Sept. 1882, coll. rev. E. Faber. Unquestionably referable to this species, of which this is the only Chinese specimen I have in my herbarium.

97. *Asplenium thelypteroides* Michx.—In jugo Lo-fau-shan, prov. Cantonensis, versus finem m. Septembris 1882, coll. rev. E. Faber. Quite undistinguishable from the United States plant. I have it

also from the New Hebrides, gathered by Capt. Fraser. Known from Japan, but now, I believe, first recorded from China.

98. *Aspidium auriculatum* Sw. — In jugo Lo-fau-shan, prov. Cantonensis, d. 22 Sept. 1882, leg. rev. E. Faber. The only Chinese specimen I have seen of this fern.

99. *Lycopodium serratum* Thunb. — In jugo Lo-fau-shan, prov. Cantonensis, sub fine m. Sept. 1882, coll. rev. E. Faber. Now, I believe, first recorded from China. Franchet and Savatier, curiously enough, reduce *L. lucidulum* Michx. to this (Enum. pl. japon. ii. 196).

100. *Lycopodii* sp. — In jugo Lo-fau-shan, prov. Cantonensis, m. Sept. 1882, leg. rev. E. Faber. Identical, if I am not mistaken, with an unnamed specimen distributed by Sir J. D. Hooker, and gathered in Sikkim, at 1000 feet elevation. It is near the last, but the leaves are quite entire; still, as *L. Selago* L. is found with leaves both entire and serrate, this may not be a character of specific value. The late Dr. Thwaites' n. 1415, referred by him as a variety to *L. serratum*, seems to me more nearly allied to *L. Selago*.

LOBELIA URENS L. IN CORNWALL, WITH NOTES ON ITS SINGLE DEVON STATION.

By T. R. Archer Briggs, F.L.S.

Lobelia urens L., hitherto considered to grow in the United Kingdom in the county of Devon only, will henceforth have to be accounted a species of the sister county of Cornwall also. To a lady, Miss Woods, a relative of the late well-known author of 'Tourists' Flora,' belongs the honour of the discovery of the plant in the additional county, though the interesting fact of its occurrence here would not have been made known to botanists generally had it not been for the zeal and energy of the Rev. R. P. Murray, who recently wrote me of his having been shown a coloured sketch of the plant by Miss J. M. Woods (a cousin of the discoverer), the original of which was gathered on September 18th, 1878, on a moor between Lostwithiel and St. Veep: Miss J. M. Woods had herself twice seen the Lobelia there, and thought there was a fair quantity.

Curiously enough, a little while after receiving this information from Mr. Murray, I came across the following statement in an article by that able botanist the late Mr. F. M. Webb, entitled "Notes upon some Plants in the British Herbarium at the Royal Botanic Garden, Edinburgh," published in Trans. R. B. S. Edin., vol. xiii.:—"*Lobelia urens*.—Very fine specimens from Dalwood, near Axminster, 1849 (C. Murchison) and good ones from Hore and Ward, ten years earlier. Two others are marked Cornwall—a county error" (p. 102, 1879). Doubting Mr. Webb's conclusion, his particulars only increased my anxiety to visit the locality indicated by Miss J. M. Woods to Mr. Murray as the home of the Lobelia; and on October 10th I carried my desire into effect by walking from Lostwithiel to St. Veep, and exploring some of

the intervening country. To my great delight I found the Lobelia in two places, about a couple of miles apart, but both situated between Lostwithiel and St. Veep. One of these stations is an enclosed, though unbroken, rough pasture of about five acres, with a stiff clayey soil, producing short grass and sedge, with *Scabiosa Succisa*, and patches of furze and some heath. Here were dozens of specimens still in flower, and some of the spikes, protected by the furze, were considerably over a foot high, though the greater number were shorter, the least attaining only a few inches. The field probably contains altogether hundreds of roots, for, although cattle had cropped off some of the flower-spikes, they were to be seen rising up from a very considerable extent of surface. I notice that the flowers become of a much brighter blue when dried; when living they have a somewhat purplish hue.

The other station is a small enclosure of about an acre, consisting partly of undrained bog, with *Menyanthes*, *Juncus acutiflorus*, *Molinia*, &c. Here it occurs for ten or fifteen yards by a small bushy ridge near the bog, and also on the damp lower portion of a hedge-bank; but altogether appears only sparingly. It is associated with *Aquilegia*, *Hypericum undulatum*, *Viola lactea*, *Hydrocotyle*, *Serratula*, *Bartsia viscosa*, *Salix repens*, a few bushes of *Myrica*, with brambles, furze, &c.

The tract belongs to Watson's vice-county 2 (E. Cornwall), being within the basin of the Fowey, both the stations lying on the left of the river. The rocks are slates of the Devonian or Old Red Sandstone age. Speaking broadly, the portion of Cornwall now found to produce *Lobelia urens* may be said to lie between the respective tracts of *Physospermum cornubiense* and *Erica ciliaris*. We may expect to find it occurring elsewhere in the portion of the county between the towns of Truro and Liskeard, a part hitherto but little explored by botanists. These Cornish stations must be, as the crow flies, about sixty miles from its Devon one near Axminster. It will be well to append a few particulars respecting this, as two or three Devon stations have erroneously been named for the plant. A very precise and interesting account of it, as an Axminster species, is to be found in a little book entitled 'The Ferns of the Axe and its Tributaries, with an Account of the flower *Lobelia urens*,' by the Rev. Z. I. Edwards, published in 1862. Presuming the work is known to but few botanists, I extract the following particulars concerning the Lobelia at Axminster from its pages:—"As Hudson first described it in 1778 and quotes as his authority Mr. Newberry, it is probable that Mr. Newberry discovered it between 1762" (date of ed. 1 of 'Flora Anglica') "and 1778. At this time Mr. Newberry lived at Heathstock, in the parish of Stockland, and as he was a noted herbalist, and had the reputation of knowing every plant of the neighbourhood, was likely to notice the flower when journeying to Axminster." After speaking of the station as recorded respectively by Hudson, Polwhele, Lord Webb Seymour (in Curtis's 'Fl. Londinensis'), and Withering (eds. 2 and 3), Mr. Edwards adds:—"Smith (Fl. Brit.) gives Kilmington Hill (on the authority of Curtis's Fl. Londin.), two

miles from Axminster, close to the road. Smith adds, in his later books, 'Near Ottery St. Mary, Miss Burgess.' Dr. Beeke, in 'Botanist's Guide,' tells us that Kilmington Hill and Shute Common are the same place." . . . . "Mr. Ravenshaw has fallen into the mistake of separating Shute Common from Kilmington Hill, and has added two other localities, Seaton and Woodbury Common. With respect to Seaton, it is too near home to have escaped observation, if it had been growing there. As to Woodbury Common, it seems that Mr. Ravenshaw drew his information from the Supplement to the 'New Botanist's Guide,' in which the mistake was first made. In that work Mr. Abraham, of Heavitree, near Exeter, is quoted as the authority for that station, who, upon inquiry, has kindly communicated that this is 'an erroneous statement.' It may be remarked, with reference to the flower being found growing at Ottery St. Mary, that this was not correct. Miss Burgess, of Ottery, was on a visit at Coryton House, Axminster, when she observed it and made others acquainted with the circumstance. Hence originated this mistake." . . . . . "In Kilmington Common it has at present (1862) a range of about a mile in length, and in no place more than a hundred yards in breadth. In some fields that have been recently cultivated, within the range of its usual haunt, the flower has appeared in great abundance on the newly turned-up ground." Mr. Edwards adds:—"A more precise description of its exact locality will not be given, as some naturalists are of a very grasping character, and instead of a few specimens, a case has occurred where a basketful has been borne away by a single individual." The Rev. Z. I. Edwards, as Rector of Combpyne, only $4\frac{1}{2}$ miles from Axminster, was located in a spot well situated for observations on the *Lobelia urens* at its single Devon station.

A SECOND NEW CHINESE *PODOPHYLLUM*.

By Henry F. Hance, Ph.D., F.L.S., &c.

It is not a little singular that, so shortly after the detection of the Formosan *Podophyllum*, another species of the genus should be met with in the south-east of the empire, agreeing with its insular ally in the colour, number, and atrocious odour of its flowers, but differing by their extra-axillary position, just as the Himalayan *P. Emodi* Wall. disagrees with *P. peltatum* Linn. This plant has been found of late in various localities of the Canton province, and I have several specimens of it alive, but it had not been met with in flower until my friend the Rev. B. C. Henry gathered it in May last in the Lo-fau-shan Mountains. His specimens arrived in a very unsatisfactory condition, owing to the torrential rains to which he was exposed, but I have been able to draw up, from the examination of a few dried flowers, a trustworthy diagnosis, closely modelled on that of the Formosan plant, which I give below.

The difference in the arrangement of the flowers in the four

species is very striking, and would be worth study. Prof. Baillon speaks of them as borne "au sommet d'une espèce de hampe,"* which is, I fear, unsatisfactory and misleading. He is an enthusiastic pupil of Payer's, the best portion of whose excellent 'Eléments de botanique' is, I think, that devoted to inflorescence. I hope, if Dr. Baillon should chance to see these remarks, that he may be induced to study morphologically the inflorescence of the genus. I feel assured he would be repaid for the trouble. No one will refuse the name of petiole to the stalks of both leaves in *P. peltatum* or *P. pleianthum*, but the prolongation above the lower leaf in *P. Emodi* and *P. versipelle* must, I think, be regarded as a continuation of the stem,—or, morphologically speaking, rather branch, since the rhizome is the true stem—and the petiole of the upper leaf as arising only just above the insertion of the flower or flowers. In the new plant the leaves vary marvellously in outline from a square, parallellogram, triangle or pentagon, to a circle, and are either with or without lobes. The flowers are only half as large as in *P. pleianthum*, and the anthers are twice as long as the filaments.

P. versipelle, sp. nov. — Caule squamis 4–5 imbricantibus scariosis ovatis acutiusculis pollicaribus cincto erecto glaberrimo pallide viridi, foliis sterilibus solitariis caulinis binis crassiusculis glaberrimis supra sublucidis sæpiusque maculis saturate v. atro-viridibus plus minus distincte pictis subtus pallidis centrice v. subcentrice peltatis nunc orbiculatis v. quadratis 5–7 angulatis faciebus inter angulos planis v. concavis angulis in lobum triangulatum protractis nervis supra impressis subtus leviter tantum prominulis margine remotiuscule subulato-denticulatis $2\frac{1}{2}$–7 poll. diametro petiolis 1–6 poll. longis, floribus 4–5 ad apicem caulis infra folium superius petiolo vix pollicari præditum nascentibus ebracteatis cernuis odorem putridum spargentibus expansis diametro $1\frac{1}{2}$ pollicaribus, pedicellis $1\frac{1}{2}$ pollicaribus apice paulo incrassatis, sepalis adpressis ovatis obtusis venosis 3–9 lin. longis 3–4 lin. latis interioribus conspicue majoribus, petalis oblongis lata basi sessilibus obtusissimis apice leviter crenulatis nervis anastomosantibus percursis sordide rubris 9 lin. longis 4 lin. latis, staminum 6 petalis vix breviorum antheris filamento complanato duplo longioribus connectivo in apiculum obtusum $\frac{1}{2}$ linealem producto, ovario ellipsoideo-sphærico stylo brevi stigmateque magno peltato coronato filamenta paulo superante, ovulis indefinitis circ. 4-seriatis.

In fissuris montium Lo-fau-shan, prov. Cantonensis, juxta cœnobium buddhicum Put-wan-mun, alt. 2000 ped. et ultra, florens legit rev. B. C. Henry, m. Maio 1883; in variis prov. locis sterile invenerunt cll. Faber et Ford. (Herb. propr. n. 22200).

The species of the genus at present known may be conveniently arranged thus :—

I. *Diplostemon.*—Stamina petalis duplo numerosiora.
Flores albi, solitarii, inter folia opposita terminales. Americanum. . . . . *P. peltatum*

* Hist. d. pl. iii. 59.

II. *Isostemona*.—Stamina petalis numero æqualia. Asiatica.
  a. *albiflorum*. Flores solitarii, extra-axillares. *P. Emodi*.
  β. *purpurascentia*. Flores aggregati.
    a. Flores inter folia opposita terminales. *P. pleianthum*.
    b. Flores extra-axillares . . . *P. versipelle*.

LOCAL CATALOGUES USED IN PREPARING WATSON'S 'TOPOGRAPHICAL BOTANY.'

By B. Daydon Jackson, Sec. L.S.

(Concluded from p. 346).

Lettering "County Catalogues. England. B to K. H. C. Watson." 8vo.

74. L. C., ed. 6. Berks, by Mr. Britten, 1873.
75. ,, ed. 6. Bucks, by Mr. Britten, 1873.
76. ,, [ed. 5, cover missing]. [Codified list of Bucks plants, compiled from the above (?) and other sources].
A note, appended, dated October, 1868.
77. L. C., ed. 6. Cambridge. Prof. C. C. Babington.
78. ,, ed. 6. Cheshire, 1867. Hon. J. L. Warren.
[Rubi observed by Rev. A. Bloxam near Tabley House, Aug. 29th, 1867].
79. L. C., ed. 6. Cheshire. Hon. J. B. L. Warren, 1873.
"N.B. In quoting this Cat. the 'MS.' is snbstituted for 'Cat.,' which applied to that of 1867."
Inserted:—Notes on a projected Cheshire Flora. By J. Leicester Warren.
80. Edinb. Cat. Cornwall, marked by Mr. G. S. Gibson, 1846. *Not all* that he saw there of the *common* species.
81. L. C., ed. 6. E. Cornwall, by T. R. A. Briggs.
82. ,, ed. 2. List of Trewhiddle (5 miles) and Cornwall plants, 1880. Mr. Pascoe.
83. L. C., ed. 6. 1. West Cornwall, 1871. Jas. Cunnack.
84. ,, ed. 6. Cumberland. J. G. Baker. [No date].
85. ,, ed. 2. Bideford, Barnstaple. G. Maw. [No date].
86. ,, ed. 3. Torquay plants, noticed in Sept., 1850, by T. B. Flower.
87. L. C., ed. 6. 3. South Devon, by T. R. A. Briggs, 1871.
88. ,, ed. 2. Plymouth. Checked from Mr. Keys' 'Index.'
The 'Index Floræ Plymouthiensis,' by Isaiah W. N. Keys, is inserted. [1850].
89. L. C., ed. 6. Dorset. 3rd Catalogue, 1867. J. C. Mansel.
90. ,, ed. 5. Seen in the county of Dorset by J. C. Mansel. [No date].
91. L. C., ed. 6. Dorset. By Mr. Mansel-Pleydell, Feb., 1873.
92. ,, ed. 2. Within five miles of Newcastle-on-Tyne. J. Storey, 1850.

Inserted :—'An enumeration of plants within five miles of Newcastle-on-Tyne.'

93. L. C., ed. 5. County of Durham. Rev. A. M. Norman. [1861].
94. ,, ed. 2. Kelvedon Plants. E. G. Varenne. [No date].
95. ,, ed. 1. Bristol, Gloucester, and Somerset. By Mr. Thwaites, of Bristol. [No date].

"I have marked some plants that appear to be introduced, but not all. J. D. H[ooker]."

96. L. C., ed. 2. Cheltenham. C. Prentice. [No date].
97. ,, ed. 6. Shedfield. F. Townsend. Nov., 1873.
98. A Catalogue of Flowering Plants and Ferns growing wild in the Isle of Wight. By A. G. More. [1859].
99. L. C., ed. 5. Isle of Wight. A. G. More. 1862.
100. L. C., ed. 1. Isle of Wight. Bromfield. [No date].
101. ,, ed. 6. Newport, Isle of Wight. Fred. Stratton. [No date].

Contains also references to Denbigh, Devon, Shropshire, and Somerset, in 1871–72.

102. L. C., ed. 1. Species found near Ross, by W. H. Purchas. [1854 ?].
103. ,, ed. 3. 2nd Huntingdon List, 1852, by Rev. W. W. Newbould.
104. Catalogue of Plants in the County of Huntingdon, by Rev. W. W. Newbould, 1846. With additions from a second Catalogue, prepared by W. W. N. in 1852.
105. [Letter from J. G. Baker, reporting additions to East Kent].
106. L. C., ed. 7. Plants seen in Kent in 1875. By F. M. Webb.

Lettering "County Catalogues. England. L to Y. H. C. Watson."

107. L. C., ed. 6. 59. South Lancashire. F. M. Webb. [1872].
108. ,, ed. 4. Leicestershire Genl. Cat. Rev. W. H. Coleman.
109. ,, ed. 2. Ashby-de-la-Zouch. Rev. W. H. Coleman. [1850].
110. ,, ed. 2. Twycross, Leicestershire. Rev. A. Bloxam.
111. ,, ed. 5. Within ten miles of Louth. T. W. Bogg. [1858].
112. ,, ed. 5. Harrow, Middlesex. Rev. W. M. Hind.
113. ,, ed. 2. Fakenham. Mr. Notcutt.
114. ,, ed. 2. Berwick-on-Tweed (3 miles). Dr. Johnston. [1850].
115. ,, ed. 2. Alnwick. Mr. Geo. R. Tate.
116. ,, ed. 2. Catalogue of plants near Embleton.
117. ,, ed. 2. Shrewsbury and Shropshire. Rev. W. A. Leighton.
118. ,, ed. 2. Dunster. Rev. W. H. Coleman. 1849.
119. ,, ed. 6. Staffordshire. Dr. Fraser.
120. ,, ed. 3. Plants within three miles of Stafford. Rev. R. C. Douglas. 2nd copy (1851) amended.
121. L. C., ed. 5. East Suffolk, 1861. Rev. W. H. Purchas.

122. L. C., ed. 3. Plants growing wild in the parish of Hitcham, Suffolk. Checked from the list printed for Rev. J. S. Henslow.

123. L. C., ed. 6. West Suffolk. Prof. C. C. Babington.

124. ,, ed. 6. Suffolk, by Mr. Skepper, per Rev. E. N. Bloomfield.

125. ,, ed. 6. Suffolk, by Rev. E. N. Bloomfield. [1875].

126. ,, ed. 5. Surrey. J. Ellis; Rev. E. Wood.

127. ,, ed. 2. Surrey Flora. N.E. Division, F. Naylor.

128. ,, ed. 2. Catalogue of plants reported to grow in Surrey, marked by Mr. J. D. Salmon. 1848.

129. L. C., ed. 6. Species observed, July, 1869, in North-west Sussex, near Shottermill, Lynchmere, and Fernhurst, by J. G. Baker.

130. L. C., ed. 2. List of Henfield and Sussex Plants, 1850. Mr. Borrer.

131. ,, ed. 7. East Sussex. J. L. Warren.

132. ,, ed. 7. West Sussex. J. L. Warren.

133. ,, ed. 2. Atherstone, Warwickshire side. Rev. A. Bloxam.

134. ,, ed. 5. Warwickshire. T. Kirk. [1862].

135. ,, ed. 2. First division of Wiltshire plants. T. B. Flower. [1850].

136. L. C., ed. 2. Second division of Wiltshire plants. T. B. Flower. [1850].

137. L. C., ed. 2. Third division of Wiltshire plants. T. B. Flower. [1850].

138. L. C., ed. 6. Rev. T. Preston's additions to Mr. Flower's (1850) Lists of N. Wilts plants. 1873.

139. L. C., ed. 1. Plants of Wilts. Dr. Southby.

140. ,, ed. 2. T. B. Flower's list of Wilts plants. 1849.

141. ,, ed. 2. Richmond. Mr. Ward. [1850].

142. ,, ed. 1. Yorkshire. Tatham.

143. ,, ed. 2. Settle. Mr. Tatham.

144. ,, ed. 2. Thirsk Catalogue. Mr. J. G. Baker.

145. ,, ed. 6. 64. Mid-west York. Dr. F. A. Lees. 1873.

146. Letter from Rev. A. Bloxam, with list of the rarer plants seen about Windermere in May, 1873.

147. L. C., ed. 6. 63. South-west York. Dr. F. A. Lees. 1873.

Lettering "County Catalogues. Wales, Scotland. H. C. Watson."

148. L. C., ed. 6. Anglesea, by F. Robinson.

149. ,, ed. 6. Carnarvon, by F. Robinson.

150. ,, ed. 6. Flint, by F. Robinson.

151. 48. Merionethshire. MS. list of 183 plants observed between Berwyn and Dolgelley, by Mr. James Britten. 1877.

152. Plants noticed in the immediate neighbourhood of Aberystwith, September and October, 1848. By W. H. Purchas.

153. L. C., ed. 2. List of Pembrokeshire Plants observed by Chas. C. Babington and the Rev. W. W. Newbould in August, 1848.

154. L. C., ed. 3. Pembrokeshire List, 1851. C. C. Babington.

155. ,, ed. 7. Radnorshire. E. H. Jones. 1877. [With a few records by Rev. A. Ley].

156. L. C., ed. 5. North Aberdeen, marked by Prof. Dickie.
157. ,, ed. 5. South Aberdeen, marked by Prof. Dickie.
158. ,, ed. 6. Ayrshire. Rev. J. P. Duncan.
159. ,, ed. 6. Buteshire; Arran, Bute, Cumbraes. By R. Hennedy, 1872.
160. L. C., ed. 7. Caithness. 1880. D. Nicolson.
161. ,, ed. 6. Caithness. By the late Robert Dick and Robert Brown, with additions by Chas. W. Peach. 1872.
162. L. C., ed. 7. Caithness. 1880. By James Grant.
163. ,, ed. 1. Cantire and Isle of Islay. Prof. Balfour. [1844].
164. ,, ed. 2. Town and County of Dumfries. P. Gray.
165. ,, ed. 2. Dumfries, West side of, and County of Kirkcudbright. By Peter Gray.
166. Localities for Plants near Edinburgh. By Isaac Bayley Balfour.
(Reprint of three printed sides from ———?).
167. E. C., ed. 2. Edinbro', &c.
(Apparently not applied as intended).
168. Elgin. Collectanea for a flora of Moray.
Marked by Rev. G. Gordon.
169. L. C., ed. 6. Catalogue of Plants of South-mid Fife in a radius of about five miles round Balmuto. J. Boswell Syme. 1868–9.
170. L. C., ed. 2. Fifeshire. Marked by Mr. G. Lawson for 2nd vol. of Cybele Britannica.
Marked in an imperfect copy, wanting pp. 1–4, 13–16.
171. L. C., ed. 6. Forth Counties. I. B. Balfour.
172. ,, ed. 6. Haddington, Edinburgh, Linlithgow, &c. By Prof. Balfour.
173. L. C., ed. 3. Kincardineshire, by J. T. Syme.
174. ,, ed. 4. Within four miles of Brotherton, Kincardine. Mrs. Dickson.
175. L. C., ed. 6. Lanarkshire, by Mr. Hennedy.
176. Nairn. Collectanea for a Flora of Moray.
Marked for this county by Wm. Alex. Stables.
177. L. C., ed. 3. Ochillshire, by J. T. Syme.
178. ,, ed. 2. Orkney plants in a bundle bought from Mr. Pamplin, and believed from the evidence of labels, &c., to have belonged to Dr. Gillies.
179. L. C., ed. 6. Seen by Miss Worsley and Miss Cerf, St. Fillans, Perthshire, July, August, and September, 1872.
Inserted :—Flora of Peebleshire. 6th July, 1880.
180. L. C., ed. 6. Renfrewshire, by Mr. R. Hennedy.
181. ,, ed. 7. List of Stirlingshire Plants. J. F. D[uthie]. 1875.

Lettering "Ex Bibl. H. C. Watson. MS. Floras." 4to.

182. List of plants collected in or near Renfrewshire, chiefly by a Mr. J. Montgomery. March, 1834.
183. MS. Flora of Jedburgh, Roxburgh, by Rev. James Duncan (given to me in 1832). H. C. W. 88 pages.

184. Flora of Cornwall. Extracted from the 'Hortus Siccus' of the Horticultural Society of Cornwall. By Miss Elizabeth A. Warren. 1860. Recopied from Mrs. Warren's MS., but her hand not very clear in names. [30 folios in Watson's handwriting on the backs of circular announcing the dissolution of the Botanical Society of London in 1856].

Lettering "Ex. Bibl. H. C. Watson. MS. Floras." fol.

185. A Contribution towards a new Flora of Bedfordshire, by W. Hillhouse.

A reprint from the 'Bedfordshire Mercury,' Jan. 22nd, 1876.

186. Bedfordshire Plant List. 1875. [By W. Hillhouse].

187. A List of Plants observed growing in North and South Essex, by E. G. Varenne.

188. The Flora of Sussex. F. A. Malleson.

Has some additions by Gerard Smith.

Lettering "Local Catalogues. H. C. Watson." fol.

189. List of Plants found in the Isle of Skye. By Lawson and Fox.

190. Harrow Flora. Additions to, by Rev. Wm. Hinds ?

A copy of the 'Harrow Gazette,' Feb. 1st, 1861, with a list of plants on pp. 3–4.

191. British Plants growing wild . . . . . in the parish of Hitcham, Suffolk. By the Rev. J. S. Henslow.

192. Id. Another edition.

193. Edinb. Cat., fol. Plants observed in Rosshire, including the county of Cromarty , ... G. Gordon. Feb., 1834.

194. L. C., ed. 1, fol. From MS. Flora of Jedburgh, by Rev. James Duncan.

195. ,, List of the Flora of Cornwall, according to the Horticultural Society's 'Hortus Siccus.' N.B. Checked from a MS. list (with localities and authors) lent to me by Mrs. Warren.

196. L. C., ed. 1, fol. Chudleigh and vicinity. Checked from the list in Jones' Botanical Tour in Cornwall and Devon.

197. L. C., ed. 1, fol. Within eight miles of Poole, Dorset. Checked from Dr. Salter's Catalogue.

198. L. C., ed. 1, fol. Forster's Flora of Tunbridge Wells.

199. ,, South Kent. Checked from Rev. G. E. Smith's marked catalogue used in preparing the New Bot. Guide, &c.

200. L. C., ed. 1, fol. Faversham Plants. Checked from Cowell's Flora Guide for E. Kent, pp. 18–54.

201. L. C., ed. 1, fol. Malvern Plants. Checked from Lees's Flora.

202. ,, Plants of Warwickshire, chiefly Allesley and Coleshill. Checked from Rev. W. T. Bree's alphabetical checked cat.

203. L. C., ed. 1. fol. Reigate. Checked from Luxford's Flora of Reigate, with the additions by Holman in Phytol., i.

204. L. C., ed. 1, fol. Checked off from an alphabetical Catalogue of Norfolk Plants, by Miss Bell, of Stow Vicarage, in 1832.

205. L. C., ed. 1, fol. List of Plants of South Lancashire, chiefly in or near Prestwich. Checked from a local herbarium collection by Mr. "Joe Goodlad," and sent to B[ot]. S[oc]. L[ond].

206. L. C., ed. 1, fol. Lower Tees Plants. Taken from Mr. John Hogg's checked catalogue.

207. L. C., ed. 1, fol. Barnstaple and Braunton. H. C. W.

208. ,, Shoreham, July 26th, 1850; within two miles of the railway station. H. C. Watson.

209. L. C., ed. 1, fol. Seen July 23rd, 1850, about Hurstpierpoint, and thence along road to Hassock's Gate Station. H. C. W.

210. L. C., ed. 1, fol. Brighton, July, 1850. All within two miles of the town probably. H. C. W.

211. L. C., ed. 1, fol. Near the Avon, below Bristol, Gloucestershire, Sept. 26th, 1850. Seen by H. C. W.

212. L. C. ed. 1, fol. Plants seen in Flintshire, Welsh side of the Dee Channel, below Chester, Sept. 1st, 1850, by H. C. Watson.

213. E. C., fol. Plants of Wirral Hundred, Cheshire. H. C. W.

214. L. C., ed. 1, fol. Plants seen near Chester, Sept. 1st, 1850. H. C. W.

215. L. C., ed. 1, fol. Plants seen near Stockport, Aug. 30th, 1850. H. C. W.

216. L. C., ed. 1, fol. Between Parkgate and Hooton Station, Aug. 31st, 1850. H. C. W.

217. L. C., ed. 1, fol. Seen in Cumberland, vicinity of Keswick and Thirlmere, by H. C. Watson.

(Also additions from Winch and others).

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EXAMINATION OF MR. A. STEPHEN WILSON'S "SCLEROTIA" OF *PHYTOPHTHORA INFESTANS*.

By George Murray, F.L.S., & Walter Flight, D.Sc., F.R.S.

In the 'Gardeners' Chronicle' for 1882, p. 460, Mr. A. Stephen Wilson published an account of certain bodies found in potato leaves, &c., which he offered evidence to prove were of the nature of sclerotia, and further, that they formed a phase in the life-history of the potato fungus. It is unnecessary to deal in detail with the nature of Mr. Wilson's evidence: to put the case shortly, he contended that these so-called sclerotia were masses of protoplasm in a more or less hardened and dormant condition, which under favourable circumstances resumed activity after the fashion of plasmodia. It need not be said that this was a startling departure from the accepted notions of the life-history of an organism of the

affinities of *Phytophthora infestans*. Though we have zoospores in fungi of this kind, there is no nearer approach to the exhibition of the characteristics of an amœboid cell such as are shown by plasmodia. In spite of this Mr. Plowright accepted (*op. cit.*, p. 630) their connection with the potato disease, and Mr. Worthington Smith suggested (Gard. Chron. i. 413, 1883) that "the Protomyces of Martius and Berkeley, the Tuburcinia of Berkeley, and the Sclerotia of Wilson, may possibly be all identical and undoubtedly of fungus origin." Mr. Murray contended ('Journal of Horticulture,' March 15th, 1883) that the description of these bodies as sclerotia was mistaken, since they did not conform to the definition of such structures as *compact mycelium*. Mr. Wilson replied to his criticism, but his reply threw no new light on the matter, and merely stated that he differed from the commonly accepted definition of a sclerotium—a matter not to be wondered at, considering the number of new and utterly useless descriptive terms he thinks it right to employ in his account of these bodies. Finally, to satisfy or confirm Mr. Murray's doubts, which were expressed at meetings of the Scientific Committee of the Royal Horticultural Society (Gard. Chron. 1883, i. 479), Mr. Wilson, with much kindness, sent to that Board a series of specimens for his inspection, and the result has been communicated shortly to the committee.

There was no sign whatever of the breaking down of cells and cell-contents in the neighbourhood of the so-called sclerotia such as commonly accompanies the presence of a fungus, and the microscopical examination forced upon one the conclusion that they were merely a form or product of cell-contents. However, the potatoes sent by Mr. Wilson were grown and watched, and numerous cultivation experiments were instituted with the bodies in question, the result being in all cases negative as regards any manifestation of life whatever in them. The "plasmodiation," "myceliation," &c., described by Mr. Wilson, wholly failed to appear. Returning then to the original opinion that they were merely a form of cell-contents, inquiry was made as to their nature. Finding them insoluble in acetic acid (though Mr. Wilson stated, in a letter to Mr. Murray, that they are soluble under such circumstances), but soluble in dilute nitric acid, the guess was ventured (first privately by Mr. Geddes) that they might be oxalate of lime. It was then determined to test them for this substance, and, after a minute search through four portions of leaves for any other appearance of this substance, and none being found, the portions were submitted to Dr. Flight that he might carry out the test.

These four portions were placed in dilute nitric acid, and, after the lapse of half an hour, the so-called sclerotia had entirely vanished. The fragments of leaves were removed from the liquid, which was then evaporated, but not to dryness, to remove the excess of acid. It was then rendered alkaline with ammonia and allowed to stand over night. In the morning crystals, having the form of a square-based octahedron, were seen plentifully in the liquid under the microscope, the greater part having separated in an amorphous state. We have therefore no hesitation in saying that

these so-called sclerotia of *Phytophthora infestans* are merely masses of oxalate of lime.

It might be contended by Mr. Wilson that, since oxalate of lime is to be found in certain plasmodia, a mistake has been made, but the application of dilute nitric acid for half an hour to the leaves would not have been sufficient to remove all trace whatever of a protoplasmic structure such as a plasmodium.

CINCHONA LEDGERIANA.

By Henry Trimen, M.B., F.L.S.

I fail to see that Dr. Kuntze has in any way strengthened his position by his attempt (p. 293) to discover discrepancies in my two articles on *C. Ledgeriana*. In the latter one I was only concerned to show that this species, if protected from chances of cross-fertilization, produced its own seed abundantly, and that such seed came as true as that of other species under similar circumstances. All the species of Cinchona vary a good deal in leaf-form, and I do not agree with Dr. Kuntze in considering that it is "necessary for a species" to produce perfectly true seed.

It is of course a matter of but little importance whether the easily recognizable characters which distinguish *C. Ledgeriana* be held of sufficient weight to distinguish it as a species, or merely a variety: nobody expects unanimity among botanists on such a point. But that it is *hybrid* there is not one jot of evidence to show. Dr. Kuntze says it is "proved" by the botanical characters, but a good deal more than such resemblances will be required to satisfy inquirers of the truth of his assumptions.

There is some evidence with quite the opposite tendency. In 1881 Mr. Moens commenced, in the Java plantations, a series of artificial crossings of Cinchona; amongst others he succeeded in crossing *C. Calisaya* with *C. micrantha*. The resulting seed germinated, and the young plants were put out in the open in March, 1882. Here, then, according to Dr. Kuntze, was a direct synthesis of *C. Ledgeriana;* but this is what Mr. Moens wrote to me as to the result. After alluding to other artificial hybrids he had growing, he proceeds:—"The recipe of Kuntze for making *Ledgeriana*, cross-fertilization of *Calisaya* with *micrantha*, has given no *Ledgeriana*, but an intermediate form. Curiously enough, almost all these hybrids (mother *Calisaya*, father *micrantha*) have the young leaves purple like *micrantha*, but paler. *Succirubra* and *Calisaya* give an intermediate form, exactly like a great many we have in our plantations."

This is surely pretty direct disproof of Dr. Kuntze's theory, and from a source above suspicion, A good many more of his baseless assertions as to the origin of other Cinchonas are equally well disposed of in Mr. Moens' 'Kina cultuur in Azië,' the most valuable contribution to Quinology yet published, and one which it is to be hoped will be put into an English dress.

[This discussion is now closed.—Ed. Journ. Bot.]

ON LEHMANN'S ANDINE BOMAREAS.

By J. G. Baker, F.R.S.

The following are the determinations of a set of Bomareas which Mr. F. C. Lehmann has recently collected in the Andes of New Granada and Ecuador, which he is intending to distribute under their numbers :—

2340. *Hippeastrum* (*Sphærine*) *solandriflorum*, Herb.
2081. *Bomarea* (*Sphærine*) *linifolia* Baker.

2420. **Bomarea** (Sphærine) **Lehmanni**, n. sp.—Stems suberect, slender, glabrous, 2–3 ft. long. Leaves lanceolate, glabrous, ascending, 2–3 in. long, $\frac{1}{4}$–$\frac{1}{3}$ in. broad, rigid in texture, glaucous beneath and ciliated on the ribs. Umbel compound, with 6–7 flexuose ascending branches bearing 2–3 flowers each, bracteated at the base by 6–7 linear leaves ; flower-bracts minute, lanceolate ; pedicels short, cernuous, very hairy. Petals equalling the sepals, each $\frac{1}{2}$ in. long.—Its only near ally is *B. phyllostachya* Masters, which has long-stalked flowers twice as large.

2500. *B. edulis*, Herb., typical.
2664. ,, ,, var. ?
2499. *B. Carderi* Masters.
2493. *B. tomentosa*, Herb.
2783. *B. fimbriata*, Herb.. var.
2784. *B. Caldasiana*, Herb., typical.
2785. ,, ,, var.
2134. ,, ,, var.
2061. ,, ,, var.
2430. *B. Kalbreyeri* Baker.
2516, 2336. *B. patacocensis*, Herb. ; Bot. Mag., t. 6692.
1852, 2124. *B. frondea* Masters.

SHORT NOTES.

Bournemouth Algæ.—Bournemouth is a very good place for collecting specimens of the rarer Algæ, for, although there are no rocks in or near the place, there is a long stretch of sand on which one frequently can find many of the rarer sorts. I collected on the beach there, in August last, in addition to the commoner species, the following, viz., *Taonia atomaria* (plentiful), *Polysiphonia byssoides* (in great abundance), *Bonnemaisonia asparagoides*, *Haliseris polypodioides*, *Arthrocladia villosa*, *Sporochnus pedunculatus* (plentiful), *Corynospora pedicellata*, *Desmarestia ligulata*, *Griffithsia corallina* and *setacea*, *Stilophora rhizodes*, three specimens of *Naccaria Wiggii*, and one of *Dudresnaia coccinea*. Of this last species I found several specimens on the beach at Studland, which last is one of the best places I was ever at for Algæ. The specimens of *Naccaria* were all small, and looked very much like (at first sight) pieces of *Ceramium rubrum*. *Dudresnaia coccinea* is most easily recognised by its peculiarly slimy or glutinous feeling, for it does not show much

in the water. At Exmouth *Bryopsis plumosa* was not infrequent, growing in the sandy mud at low water nearly opposite the Imperial Hotel. At Slapton Sands I found numerous specimens of *Sphacelaria filicina*.—Thomas Walker.

Fertilization of Methonica gloriosa.—Having lately had this plant in bloom in my stove-house, I have had an opportunity of observing the process by which the fertilization takes place—a process which accounts for the singular shape of the blossom. With regard to the shape, I would first remark, for the benefit of those unacquainted with it, that it has three peculiarities—first, that of the three locules of the ovary one is much more developed than the other two; next that, even before as well as after the opening of the flower, the pistil is bent at a right angle to the centre line of the ovary, and then when the flower is quite open the petals are recurved till their extremities meet. Now, when the blossom first opens, the extremity of the pistil occupies an intermediate position between the stamens that project downward and the petals that are elevated above it, but as time proceeds the further rising of the petals drags the stamen with them, and causes them to come in contact with the pistil, thus rendering the chance of fertilization very great. This chance is greatly increased by a rotary movement of the pistil, caused, I think, by the unequal distention of one of the locules of the ovary before mentioned.—B. Piffard.

Leicestershire Plants.—I found *Eriophorum vaginatum* L. last May growing in small quantity in a strip of turfy ground on Charnwood Heath. The rocky and barren tract called by this name is a remnant of the original forest, of which it forms one of the highest points. *E. vaginatum* is inserted (with a query) for Leicestershire in 'Topographical Botany' on the strength of a record (also queried) from Groby Pool in Coleman's MS. list. This station, in itself somewhat improbable, does not produce it now, but does produce *E. angustifolium*, a form of which may have caused the error, if error it be. At the same time I may mention that on rocks near the same spot I have recently detected *Stereocaulon coralloides* Fr., not recorded by Mr. Bloxam in his carefully worked out list of local lichens inserted in Potter's 'Charnwood Forest.' The genus is, in fact, quite unrepresented there, though it can hardly be confounded with any other. In Leighton's 'Lichen Flora' Mr. Bloxam's Leicestershire localities are quoted very freely, but under *Stereocaulon* no record is given from that county.—H. P. Reader.

Failure of Ranunculus bulbosus to hold its Ground at Kew (p. 315).—It is likely that this "apparent weakness" is caused by the garden-beds at Kew being so unlike the natural habitat of the plant. It belongs to the group of Pascuals—plants of "pastures and grassy commons where the herbage is less luxuriant than in the meadow lands." These plants soon disappear from cultivated land, as they require a firm but finely divided soil for their roots, and, as a rule, are easily smothered by rank vegetation. If Mr.

Harmer, by aid of the 'Cybele Britannica,' will carry his examination of Mr. Baker's valuable paper a little farther, he will find that of twenty pascual British plants, Class A contains not one, and Class B only one, *Luzula campestris*. No hard and fast line can be drawn between Pascual and Pratal plants, but with this statement I think field botanists will agree.—Alfred Fryer.

Ceratophyllum submersum in Cambridgeshire and Hunts. — This grows plentifully in the Wash between the Bedford Rivers from Earith to Oxlode, and in ditches connected with the Ouse at St. Ives, Hunts. It flowers freely, but I have not been able to get fully matured fruit, although I have met with some sufficiently advanced to show the covering of "cylindrical tubercles" mentioned as characteristic by Syme in 'English Botany.' Sometimes a form occurs with a strong tubercle on each side of the base of the fruit, like "the rudiments of the spines of *C. demersum*"; but of this I have only been able to get very immature examples, owing to the fruit being so frequently eaten off by aquatic larvæ. The fruits are produced as freely in deep as in shallow water; when the plant grows luxuriantly in the former, the upper shoots are crowded together so as to be brought within the influence of warmth and sunlight. *C. demersum* seems to be absent from these localities.—Alfred Fryer.

Rumex maritimus in Middlesex and Oxon. — In the 'Flora of Middlesex,' p. 238, this plant is placed in brackets, as no longer occurring in that county, its claims to inclusion resting on a MS. record of Doody's, who found it, about 1700, near Burlington House, and near Montague House, the site of the British Museum. Later than this it was found by Samuel Dale, in 1732, "In fossa prope Annis Stæ Claræ vulgò Annisyclear dicta" (of which Bath Street, Shoreditch, marks the site), a specimen from him so labelled being now in the British Herbarium of the British Museum; and from the herbarium of R. Nicholls (about 1745) there is a specimen "gathered in Conduit Street by Hanover Square." Some doubt attaches to the statement that it was found at Hampstead by Dr. Syme (see Top. Bot. ed. 1, 665), but Mr. Newbould informs me that he observed it in that locality some few years since. Mr. John Benbow, of Uxbridge, has lately presented specimens of this and of *R. palustris*, collected by him near West Drayton, to the British Museum Herbarium, and writes as follows as to their place of growth:—"Yesterday [Oct. 31] I revisited the habitat of *Rumex palustris* and *R. maritimus*: it is undoubtedly in Middlesex, just without the boundary of Bucks. In 1864, when I last searched the spot, I found a solitary specimen of *R. palustris* only. Yesterday I counted more than twenty plants of *R. maritimus*, whilst *R. palustris* was growing in far greater abundance all round the fringe of the swamp. Since 1864 this swamp has been converted into an osier-bed, but the water which filtrates through the "refuse" from some chemical works (with which the hollow is being gradually filled up) has killed the osiers, and nothing but the decaying stumps remains. Previously the basin itself had evidently been thickly carpeted with these docks, for one or two mounds which rise slightly above the levels are also covered with young plants. Should the ensuing

season prove a wet one, and the water rise to a higher level than heretofore, the habitat will be entirely lost—indeed the encroachment of the refuse makes it only a question of time." The county of Oxford may be added to the list in Top. Bot., ed. 2, p. 360, there being a specimen in the British Museum collected by Mr. H. Boswell "near Medley Lock, Oxford, September 10th, 1866." — JAMES BRITTEN.

ARUM ITALICUM Mill. IN KENT.—Early in the month of June, 1879, I noticed growing in shady places beneath the Undercliff, Folkestone, an Arum which I strongly suspected to be *Arum italicum* (Mill.), which suspicion was confirmed upon my visiting Jersey shortly afterwards, where the plant grows abundantly. Upon returning to Folkestone later on in the month I made especial search, and noted the plant in three distinct localities in the immediate neighbourhood—(1) that of the Undercliff, just mentioned; (2) on the roadside leading between Sandgate and Shorncliffe station; (3) in Paddlesworth Lane, about three miles from Folkestone; here *A. maculatum* grows abundantly, and the two species are found intermingled. I am pretty certain that careful inspection would result in the discovery of *A. italicum* along the whole of this part of the Kentish coast; and I would especially signalize the neighbourhood of Hythe, Westenhanger, and Beechborough Park as worthy the attention of botanists visiting the neighbourhood in April, May, or June. It may also occur on the Warren. I am informed by Mr. Britten that Dr. Maxwell T. Masters has gathered it this year "in a small copse by the roadside about 1½ or 2 miles out of Folkestone, on the Canterbury Road. One plant on Feb. 6th with leaves fully expanded, amid scores or hundreds of the common species still rolled up. Soil chalk." This may be the wood well known locally as Lady Wood. Again on May 3rd, 1883, Dr. Masters again writes that he had seen "plenty of *Arum italicum* a second time, near Folkestone, always in company with the ordinary *maculatum*, but not yet observed it in flower." So far as my own experience goes, it is not a free-flowerer in this neighbourhood. It is to be expected that further research will show *A. italicum* to be pretty generally dispersed along our southern coasts.—J. COSMO MELVILL.

PLANTS OF THE LAKE DISTRICT. — The following localities for rare plants may be of interest:—*Aquilegia vulgaris* L., fine in fissures of rock 1500 ft. (?) above the Vale of St. John's. — *Potentilla fruticosa* L., above Keppel Cove Tarn, where also occurs *Dryas octopetala* L.; this is the Settle form (*major*), not the Teesdale one (*minor*). — *Hieracium argenteum* Fr., High Street range, with *H. holosericeum* Backh. and *H. chrysanthum* Backh.; *H. holosericeum* also on Glara-mara, and *H. chrysanthum* on Helvellyn.— *Vaccinium uliginosum* L., High Street range.—*Ajuga pyramidalis* L., Hill Bell range, very fine.—*Salix lapponum* L., Catchedicam. — *Carex atrata* L., Helvellyn and High Street.—*Asplenium septentrionale* L., mountains above Grasmere. — *Polystichum Lonchitis* L., Fairfield, and mountains above Hawes Water. — *Woodsia ilvensis* Br., Helvellyn and Hill Bell range.—JAMES BACKHOUSE.

Limosella aquatica in Cambridgeshire and Hunts.—This plant, not recorded from Cambs. since 1827, when it was found by Prof. Henslow at Gamlingay, grows in some abundance on the muddy shore of the Ouse at Earith Causeway, in Hunts, and on both sides of the New Bedford River from Earith to Oxlode, in Cambs. Its creeping growth, closely adpressed to the ground and rooting at the end of every branch, enables it to establish itself securely on the silty, shifting mud deposited on the very edge of the stream, and swept bare of other vegetation by the action of tides and floods. Thus freed from the rivalry of robuster growths, its pretty pink blossoms are freely produced, and their ripened seeds are carried to similar stations down the river or to such as are only submerged at high water. At Oxlode it grows wholly in the water, producing luxuriant floating shoots rarely uncovered at the lowest ebbs. These facts will explain why the plant is so frequently recorded as "growing in cart-ruts"—it evidently requiring stations mechanically cleared of other plants, and well-churned mud to grow in.—Alfred Fryer.

Crepis biennis at Eastbourne. — I gathered this plant on the 26th May last on a grassy spot in a new suburb of Eastbourne, where it occurred in tolerable plenty. *Cochlearia Armoracia* occurs in several places, but of course only as an introduction, on which ground, I suppose, Mr. Roper has not included it in his 'Flora of Eastbourne.'—F. B. Doveton.

SUPPLEMENT TO LIST OF PHANEROGAMS PUBLISHED IN BRITAIN IN 1882.

In compiling the list (pp. 112–120) of Phanerogams published in Britain during 1882, we overlooked Prof. I. Bayley Balfour's 'Diagnoses plantarum novarum Phanerogamarum Socotrensium,' published in the Proceedings of the Royal Society of Edinburgh, xi. 498–514, 834–842. The following is a list of the new genera (indicated by an asterisk) and species; all are from Socotra, and "Balf. fil." is to be understood as the authority for each, except where otherwise stated.

Menispermaceæ.—Cocculus Balfourii *Schweinf.*

Cruciferæ.—Diceratella incana. Farsetia prostrata. Brassica rostrata. Lachnocapsa* spathulata.

Capparideæ.—Cleome Socotrana.

Resedaceæ.—Reseda viridis.

Caryophylleæ.—Gypsophila montana. Polycarpæa cæspitosa, divaricata.

Hypericaceæ.—Hypericum tortuosum, scopulorum.

Malvaceæ.—Hibiscus Scotti, stenanthus, malacophyllus.

Sterculiaceæ.—Melhania muricata.

Tiliaceæ.—Grewia turbinata, bilocularis. Corchorus erodiodes. Elæocarpus transultus.

Rutaceæ.—Thamnosma Socotrana.

Burseraceæ.—Boswellia Ameero, elongata, Socotrana. Balsamodendron Socotranum, parvifolium, planifrons *Schweinf.*

Ampelideæ.—Vitis subaphylla, paniculata.

Sapindaceæ.—Allophyllus (Schmidelia) rhusiphyllus.

Anacardiaceæ.—Rhus thyrsiflora. Odina ornifolia, asplenifolia.

Leguminosæ.—Crotalaria strigulosa, dubia, pteropoda. Priotropis Socotrana. Trigonella falcata. Lotus Ononopsis, mollis. Indigofera nephrocarpa, marmorata. Taverniera sericophylla. Arthrocarpum* gracile. Ormocarpum cæruleum. Dichrostachys dehiscens. Acacia Socotrana.

Crassulaceæ.—Kalanchoe farinacea, abrupta, robusta.

Lythraceæ.—Punica protopunica.

Cucurbitaceæ.—Dendrosicyos* Socotrana.

Umbelliferæ.—Nirarathamnos* asarifolius. Carum pimpinelloides, calcicolum. Peucedanum cordatum.

Rubiaceæ.—Dirichletia venulosa, lanceolata, obovata. Placopoda* virgata. Hedyotis stellarioides. Mussænda capsulifera. Gaillonia tinctoria, puberula, thymoides.

Valerianaceæ.—Valeriana affinis.

Compositæ.—Vernonia Cockburniana. Psiadia Schweinfurthii. Phubea glutinosa, aromatica, obovata. Helichrysum sphærocephalum, arachnoides, aciculare, suffruticosum. Pulicaria diversifolia, stephanocarpa, vieræoides. Senecio (Kleinia) Scotti. Euryops Socotrana. Dicoma cana. Lactuca rhynchocarpa, crassifolia. Prenanthes amabilis. Lannæa crepoides.

NOTICES OF BOOKS.

New Books.—Grant Allen, 'Flowers and their Pedigrees' (Longmans: 7*s.* 6*d.*). — F. T. Mott, 'Fruits of all Countries' (Author, Birstal Hill, Leicester: 2*s.* 6*d.*). — C. J. F. Bunbury, 'Botanical Fragments' (8vo, pp. 370). — G. Marpmann, 'Die Spaltpilze' (8vo, pp. 193: Halle, Waisenhauses). — H. Waldner, 'Deutschlands Farne' (4to, tt. 52: Wasselnheim). — H. Christ (transl. by E. Zieche), 'La Flore de la Suisse et ses origines' (Bale, Georg.: 8vo, pp. xv., 572). — C. Schroter, 'Die Flora der Eiszeit' (4to, pp. 41: Zurich, Wurster). — M. Micheli, 'Contributions à la Flore du Paraguay: Légumineuses' (4to, pp. 73, tt. 22: Genève, Georg, 20 fr.). — T. Allin, 'Flowering Plants and Ferns in Co. Cork' (8vo, pp. xiii., 113, map: Marche, Weston-super-Mare). — C. B. Clarke, 'Cyrtandreæ' (Monographiæ Phanerogamarum prodromus, vol. v., pt. 1; 8vo, pp. 303, tt. 32: Paris, Masson).

Articles in Journals.—November.

American Naturalist. — G. Macloskie, 'Achenial hairs of *Townsendia.*'—A. F. Foerste, 'The hibernacula of Herbs.'—J. B. Ellis & A. Kellerman, 'New American Fungi.'

Ann. Sciences Nat., 6 S. xvi. no. 5 (Oct.). —Leclerc, 'De la transpiration dans les végétaux' (contd.)—A. Franchet, 'Plantes du Turkestan' (contd.: *Prunus verrucosa*, *Spiræa pilosa*, *Pyrus turkestanica*, *Umbilicus linearifolius* (t. 15), *Carum Capusi*, *Pleurospermum turkestanicum*, *Heracleum brignolifolium*, *Lonicera turkestanica*, *Aster Capusi*, *Linosyris Capusi*, *Tanacetum Capusi* (t. 16), *Anaphalis racemifera*, *Senecio akrabatensis*, *Cousinia submutica*, *C. flavispina*, *C. anomala*, *C. Capusi*, *C. acicularis*, *C. Bonvaleti*, spp. nn., 4 plates).

Botanical Gazette (Oct.).—W. G. Farlow, 'Peronosporeæ of United States.'

Botanische Zeitung (Oct. 26, Nov. 2).—J. Reinke, 'Untersuchungen über die Einwirkung des Lichtes auf die sauerstoffausscheidung der Pflanzen' (concl.).—Nov. 2). G. Berthold, 'Ueber Spiralstellung bei Florideen.' — Nov. 9, 16). E. Fischer, 'Beitrag zur Kenntniss der Gattung *Graphiola*' (1 tab.).

Bot. Centralblatt (no. 44).—I. Kühn, '*Chrysomyxa albida*, n. sp.' (No. 45).—N. J. Scheutz, 'Observationes Rhodologicæ.'

Botaniska Notiser (no. 5).—K. J. Lönnroth, '*Cuscuta Epithymum* en ny Växt för Sveriges flora.'—C. Melander, 'Bidrag till Vesterbottens och Lapplands flora.'

Bull. Soc. Bot. France (xxx. 4: Oct.).—Magnen, '*Narcissus juncifolio-Tazetta*.'—E. Roze, 'La Fécondation chez les *Azolla*.'—I. Vallot, 'Nouvel Appareil destiné à la dessiccation des plantes.'—E. Bonnet, 'Sur un Herbier de Boccone conservé au Muséum de Paris.'—M. Cornu, 'Champignons parasites des Urédinées.'—C. Royer, 'Le tubercule de l'Igname.'—Id., 'Les *Sorbus* dans la Côte d'Or' (*S. fallacina*, n. sp.).—M. Constantine, 'Influence du séjour sous le sol sur la structure anatomique des tiges.'—A. Battandier, 'Sur quelques cas d'Héteromorphisme.'—A. Chabert, 'Origine des Tulipes de la Savoie.'

Bull. Torrey Bot. Club (Sept.).—J. B. Ellis & B. M. Everhardt, 'New Fungi.'—E. G. Knight, 'Fruit of *Eustichium norvegicum*' (1 plate).—C. Wright, *Eleocharis diandra*, n. sp.

Flora (Oct. 21).—P. Krüger, 'Die oberirdischen Vegetationsorgane der Orchideen in ihren Beziehungen zu Clima und Standort' (contd.).—P. Strobl, 'Flora der Nebroden' (contd.).—(Nov. 1). A. Geheeb, 'Bryologische Fragmente, ii.'—H. Karsten, 'Natur und Entwickelung der Hysterophymen.'

Garden (Nov. 3).—*Epidendrum rhizophorum* (ic. pict.).

Gardeners' Chronicle (Nov. 3).—*Stelis zonata* Rchb. f., n. sp., *Nuphar advena* (fig. 92).—W. B. Hemsley, '*Fuchsia Exoniensis*' (fig. 101).—'List of Garden Orchids' (*Epidendrum*, contd.).—(Nov. 10). *Masdevallia brevis* Rchb. f., n. sp.—W. G. Smith, *Peronospora ganglioniformis* (fig. 106).—C. C. Babington, '*Pyrus pinnatifida*.'—Nov. 17). *Saccolabium Witteanum* Rchb. f., n. sp. *Medinilla Curtisii* (fig. 108).—J. B. Armstrong, 'Fertilisation of Red Clover.'—W. G. Smith, *Peronospora parasitica* (figs. 109–111). G. Maw, '*Narcissus viridiflorus*.'

Midland Naturalist.—J. E. Bagnall, 'Flora of Warwickshire' (contd.: *Scrophulariaceæ–Verbenaceæ*).

Naturalist.—J. Cash, 'Mr. Wilson's Tours' (concluded).

Œsterr. Bot. Zeitschrift.—J. B. Wiesbaur, 'Bosniche Rosen.'—L. Celakovsky, 'Ueber einige Stipen' (concl.: *Stipa tauricola*, n. sp.' —C. Fehlner, '*Asplenium Seelosii*.'—D. Hirc, 'Zur Flora von Croatien.'—V. Borbás, 'Die Wiedenhybride Ungarns.'—B. Blocki, 'Zur Flora von Galizien.'—P. G. Strobl, 'Flora des Etna' (contd.).

Pharmaceutical Journal (Nov. 10).—J. J. Dobbie, G. G. Henderson, & Bayley Balfour, 'Classification and properties of red Resins known as Dragon's Blood.'

Science Gossip.—E. C. Malan, '*Orchis mascula*.'

OBITUARY.

The Rev. Robert Wood, Vicar of Westward, near Wigton, Cumberland, died at that place on the 15th of March last, at the advanced age of 86 years. Although never attaining any great prominence in the scientific world, Mr. Wood was a genuine lover of Nature, and did much to encourage a similar enthusiasm in those with whom he came in contact, especially among the young. Born at Tallentire, near Cockermouth, on December 18th, 1796, he entered St. Bees' College in 1818. In 1822 he was appointed to the incumbency of Westward, and remained there until his death, the fiftieth anniversary of his incumbency being marked by his parishioners by a handsome testimonial. Mr. Wood was especially interested in British flowering plants, of which he had an accurate knowledge, although the more recent "critical" school did not attract his sympathy; his herbarium was nearly complete for the British flora. Mr. Wood published very little; a note upon *Alchemilla conjuncta*, published in this Journal for 1872 (p. 308), was his sole contribution to our pages. In a magazine called 'Young England,' in which some prominence was at one time given to science, the botanical portion being under the management of the Editor of this Journal, Mr. Wood published two lists of Cumberland plants,—one in August, 1864, the other in April, 1865,—under the signature "Wood Robert," which he frequently employed. As a clergyman Mr. Wood was very active, doing much to improve his parish in many ways. He was a kind and genial correspondent, and will be missed and regretted by many who did not know him personally. Mr. Wood's death was preceded by that of his eldest son, the Rev. Henry Hayton Wood, Rector of Holwell, Dorset. The last-named was born at Westward, Sept. 28, 1825, and died at the same place on November 3rd, 1882. He was one of the founders of the Dorset Field Club, and devoted a good deal of attention to Botany, especially to Mosses, of which he had an extensive collection, which has been acquired for the British Museum.

We regret to announce the death of the Rev. Henry Harpur Crewe, Rector of Drayton Beauchamp, near Tring, which occurred on September 7th, after a long and painful illness, at the age of

fifty-three. Mr. Crewe was best known as a horticulturist; he devoted his attention chiefly to herbaceous and bulbous plants, and those who had the pleasure of walking with him round his garden will not easily forget the great variety of beautiful species which he had in cultivation. His collection of Crocuses was characterised in 1875 by Sir J. D. Hooker—who named in compliment to him *Crocus Crewei* (Bot. Mag. t. 6168)—as "the richest in Europe"; the genus was a great favourite with him, and he made excursions to the Mediterranean Region and the East with a view of collecting the species, besides commissioning travellers to obtain all they could. He was well known as an entomologist, and had a good knowledge of British plants; he did not, however, publish any strictly botanical papers, although his horticultural contributions were numerous and useful. The specimens of *Gentiana germanica* from which our plate (t. 15) was taken were collected and forwarded to this Journal by Mr. Crewe in 1863.

Obituary of Botanists, 1882.

The following list of botanists who died during 1882, with a reference to the various publications in which some notice of their career will be found, will, it is hoped, be useful. Except where otherwise stated, the publications referred to were published during 1882, so that the repetition of that date is unnecessary.

Berndes, Wilhelm Eugene; b. Jan. 20, 1844, at Kisa; d. June 23, at Upsala. Bot. Notiser, 197.

Bouché, Emil, of Bot. Garden, Brunswick; b. at Berlin, Dec. 1822; d. at Brunswick, Aug. 25. Bot. Centralblatt, xii. 31.

Caflisch, F.; b. Mar. 3, 1817, at Herbichofen; d. May 23, at Augsburg.

Christison, Sir Robert; b. at Edinburgh, July 18, 1797; d. same place, Jan. 27. Nature, xxv. 339; Trans. Bot. Soc. Edinb. xiv. 266; Pharm. Journ. 3rd S. xii. 659.

Darwin, Charles Robert; b. at Shrewsbury, Feb. 12, 1809; d. at Down, Ap. 19. Journ. Bot. 165; Gard. Chron. xvii. 535; Nature, xxv. 597; xxvi. 49, 73, 97, 145, 169; Trans. Bot. Soc. Edinb. xiv. 284.

Decaisne, Joseph; b. Mar. 18, 1809, at Brussels; d. at Paris, Feb. 8. Journ. Bot. 158; Gard. Chron. xvii. 215; Nature, xxv. 390; Trans. Bot. Soc. Edinb. xiv. 295.

Delitsch, Otto; d. Sept. 15, at Leipzig.

Dickie, George; b. at Aberdeen, Nov. 23, 1813; d. same place, July 7. Journ. Bot. 1883, 30; Nature, xxvi. 279; Scottish Naturalist, no. 1, N. S. 3.

Garovaglio, Santo, Director of Bot. Garden, Pavia; d. at Pavia, Mar. 20, æt. 79. Bot. Centralblatt, x. 39.

Germain de Saint-Pierre, E.; d. at Hyères. Bot. Centralblatt, xi. 152.

Gulliver, George; b. at Banbury, June 4, 1804; d. at Canterbury, Nov. 17. Journ. Bot. 1883, 31.

HALL, Elihu, botanical collector; d. Sept. 24, at Athens, Illinois, æt. 60. Bot. Gazette, p. 126.

HOFFMAN, G. H.; b. 1805, at Margate; d. Mar. 31, same place. Gard. Chron. xvii. 540.

HORE, W. S.; b. 1808, at Plymouth; d. at Basingstoke, March. Journ. Bot. 288.

JAMES, Thomas Potts; b. at Radnor, Philadelphia, Sept. 1, 1808; d. Feb. 22, at Cambridge, Mass. Journ. Bot. 158; Proc. Amer. Phil. Soc. xx. 293–297.

KERCHOVE DE DENTERGHEM, Oswald; b. 1819; d. at Ghent, Feb. 21. Gard. Chron. xvii.

KIPPIST, Richard; b. 1811; d. at Chelsea, Jan. 14. Journ. Bot. 63; Gard. Chron. xvii. 91; Nature, xxv. 275.

KOSCHEWNIKOFF, Dmitrij Alexandrowitsch, director of Bot. Garden, Odessa; d. at Mentone (no date). Bot. Centralblatt, x. 280.

KREMPELHUBER, A. VON, lichenologist; d. Oct. 1, at Munich, æt. 69. Bot. Centralblatt, xii. 112.

LEDEGANCK, Casimir Charles; b. at Ghent, Ap. 20, 1843; d. at Brussels, Jan. 14. Bull. Soc. Roy. Belg. xxi. 30.

LEGGETT, William H.; d. Ap. 11.

MOGGRIDGE, Matthew; b. July 16, 1803; d. in London, July 14. Proc. Linn. Soc. 1882–83, p. 42.

NAYLOR, Frederick; d. at Kew, Dec. 21, æt. 71. Journ. Bot. 1883, 192.

PARNELL, Richard; d. at Edinburgh (no date). Journ. Bot. 1883, 30; Scottish Naturalist, no. 1, N. S. 43.

PURKINJE, Emmanuel de, prof. of forestry at Weisswasser, Bohemia; d. May 23, æt. 50.

RAVENSHAW, Thomas Fitzarthur; d. in London, Sept. 26, æt. 53. Journ. Bot. 352.

REEKS, Henry; b. at Standen, Berks, Mar. 15, 1838; d. near Andover, Feb. 20. Journ. Bot. 352.

SADLER, John; b. at Gibbleston, Fife, Feb. 3, 1837; d. at Edinburgh, Dec. 9. Journ. Bot. 1883, 31; Scottish Naturalist, no. 1, N. S. 43.

SCHLOSSER KLEKOVSKY, I. de; d. Ap. 27, at Agram, Croatia, æt. 74. Bot. Centralblatt, xi. 34.

SCHWANN, Theodor; b. Dec. 7, 1810; d. Jan. 11, at Cologne. Nature xxv. 321.

TAUSCHER, Julius; d. Mar. 16, at Erezi, Hungary, æt. 51. Bot. Centralblatt, x. 111.

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ERRATA.

Page 63 line 7 from top, *for* "Hégeoise," *read* "Liégeoise."
" 12 " *for* "Syngenerie," *read* "Syngenesie."
124 3 " *for* "viscosum," *read* "pumilum."
" 6 " *for* "pusillum," *read* "pumilum."
" 17 " *for* "Nom," *read* "Norm."
126 18 " *for* "Martius," *read* "Martin."
153 26, the name "Mai" should be placed after "Cardinal" in the next line.
190 8 from bottom, *for* "Lamium," *read* "Lanium."
216 15 from top, and elsewhere, *for* "Hanck," *read* "Hauck."
217 11 " *for* "Rtz.," *read* "Ktz."
" 22 " *for* "Rützing," *read* "Kützing."
223 bottom line, *for* "next," *read* "nut."
" line 10 from bottom, *for* "*Galinia*," *read* "*Gahnia*."
293 20, *for* "been," *read* "not."

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